PIT AND QUARRY

FEBRUARY, 1941

CONVENTION ISSUE

National Sand and Gravel, Ready-Mixed Concrete, and Crushed Stone Associations

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

●

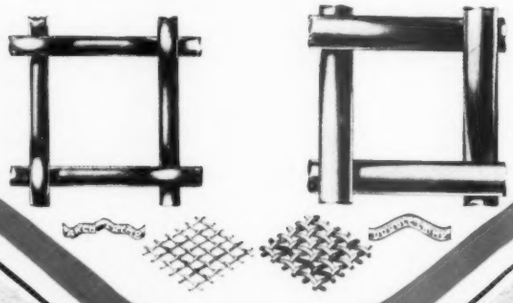
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer—

endure vibration better—

resist fatigue to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY SAINT LOUIS

ELEVATOR BUCKETS

"Continuous" type buckets are available in malleable iron and steel in a number of styles, with different shapes, depending upon material to be handled and angle at which the elevator stands.

that Last Longer!

• Use the correct bucket for the job. The Link-Belt line includes steel, malleable iron and Promal buckets of suitable size and type to meet any requirement. They are recognized as the standard for toughness—smooth, uniform construction and correct design . . . features that assure proper filling, free and clean discharge and long life.

Link-Belt malleable iron buckets are made of the same metal from which our high-grade malleable iron chains are cast. Promal buckets are stronger than buckets of malleable iron and offer a greater resistance to abrasive wear. Longer life in hard use and under severe abrasive conditions, quickly justifies their slightly higher price.

Fabricated buckets include seamless, welded and riveted construction, using metals and metal treatments which best fit these buckets for the work they are expected to perform.

Large stocks are carried at all Link-Belt plants and warehouses and by many distributors. Specially made buckets can also be supplied . . . galvanized, bronze, aluminum, and baked-enamel finish. General Catalog No. 800 contains complete engineering and descriptive data about operation and design of bucket elevators. If you don't have a copy, write for one today.

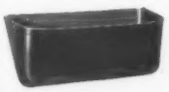
Style "A". Cast in malleable iron and Promal. This is the standard form and the most generally used for handling cement, coal, phosphate, pulp, etc. Style "AA" is similar in shape but has heavy reinforced front edges and corners which give increased life in handling material of an abrasive nature.

Style "B" malleable iron bucket is favored for use in inclined elevators and for handling coarsely broken materials.

Style "C" malleable iron bucket is designed for handling clay, sugar, finely pulverized ores and such other materials as tend to stick or pack.

Style "AA-RB" bucket for heavy service. Available in both malleable iron and Promal. The back is made twice the usual thickness of the standard "AA" bucket. The heavy lip is continued around the ends of bucket and vertical ribs reinforce the front. A most substantial and satisfactory bucket where severe service is encountered.

Corrugated seamless steel bucket. Made of one-piece pressed steel, with round corners and bottom; no laps, no rivets or seams. This bucket will stand more hard usage and is the strongest of any seamless bucket of the same gauge and size.



Super-Salem steel elevator bucket costs no more than the standard Salem. It is reinforced at digging lip, front corners and along back. Very strong and offers super-resistance to abrasive wear. The extra strength is obtained without increase in bucket weight. Numerous other Link-Belt steel buckets of suitable designs for handling grain, are available.

LINK-BELT COMPANY

Indianapolis, Chicago, Philadelphia, Atlanta, Dallas, San Francisco, Toronto, Detroit, Boston, Los Angeles, Seattle, Portland, Ore. Offices, warehouses and distributors in principal cities. 8336A

LINK-BELT
ELEVATOR BUCKETS

THE SYMBOL OF QUALITY — LB — LINK-BELT

› › › › A TYPE AND SIZE FOR EVERY SERVICE AND CAPACITY

PIT AND QUARRY, February, 1941, Vol. 33, No. 8. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 20 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

BACKED BY A RECORD

You can get your teeth into!

Ever stop to think—*"Why so many Ford Trucks?"* Ever look into the record of these powerful, trustworthy units? Here it is—a record that clearly demonstrates Ford performance, economy, reliability!

THE RECORD: More Ford Trucks have been built, and more are in use this minute than any other kind.

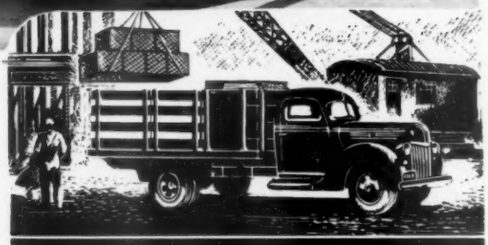
THE RECORD: Ford Trucks give amazing economy—shown in actual cost records of truck operators throughout America.

THE RECORD: Ford Trucks have extra big and extra sturdy brakes, axles, clutches, frames—there's a host of Ford Truck features that challenge comparison!

When you choose a Ford unit you get the just-right unit for your job! 42 body types. 6 wheelbases. Power choice of 85 or 95 hp engines.

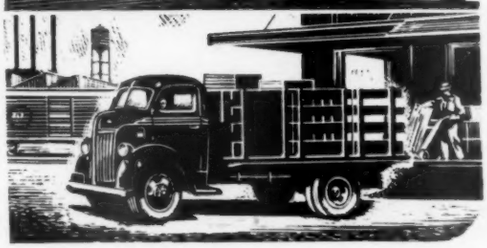
Ask your Ford Dealer to prove Ford low cost and high efficiency on *your* job with *your* driver! Make this test and check the record.

Ford

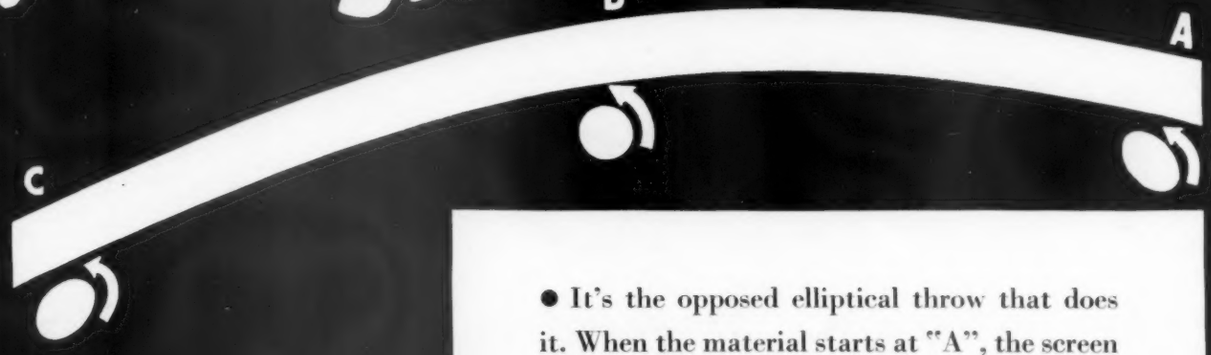


FORD TRUCKS

AND COMMERCIAL CARS



WHY PLAT-O SCREENS SIZE BETTER!



Demand these 8 Features:

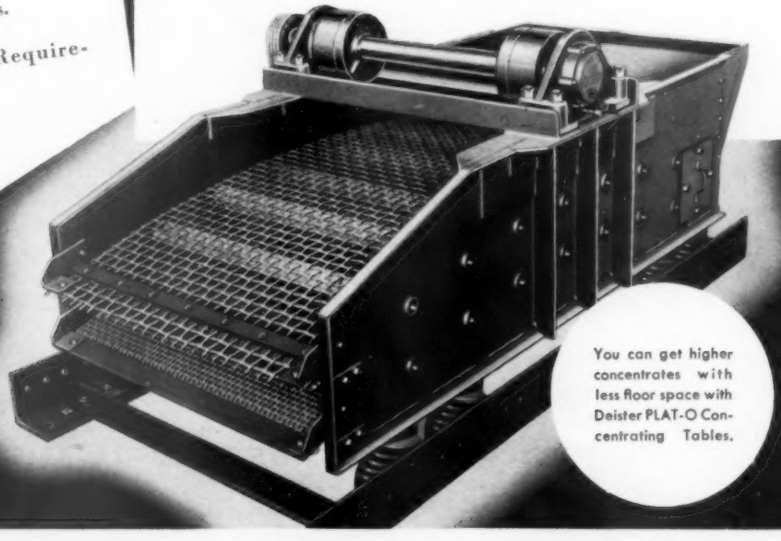
1. Opposed Elliptical Throw—Low Headroom—Accurate Grading—High Capacity.
2. Selective Throw.
3. Powerful Positive High Speed.
4. Oil—Not Grease.
5. Automatic Screen Cloth Tension—each deck independently changed.
6. Vibration Fully Cushioned.
7. Only Two Bearings.
8. Lowest Power Requirements.

● It's the opposed elliptical throw that does it. When the material starts at "A", the screen is nearly flat, and it is pushed along by the throw alone. As it progresses over the screen (with the smallest fines taken out here), the throw becomes circular, turning the material over and over.

The last third of the screen is definitely downhill—here the very large oversize shoots off, while the near-size is thrown back, turned, twisted, until the accuracy known only to PLAT-O screens is obtained. Write for new bulletin No. 27.

DEISTER MACHINE COMPANY

FORT WAYNE, INDIANA



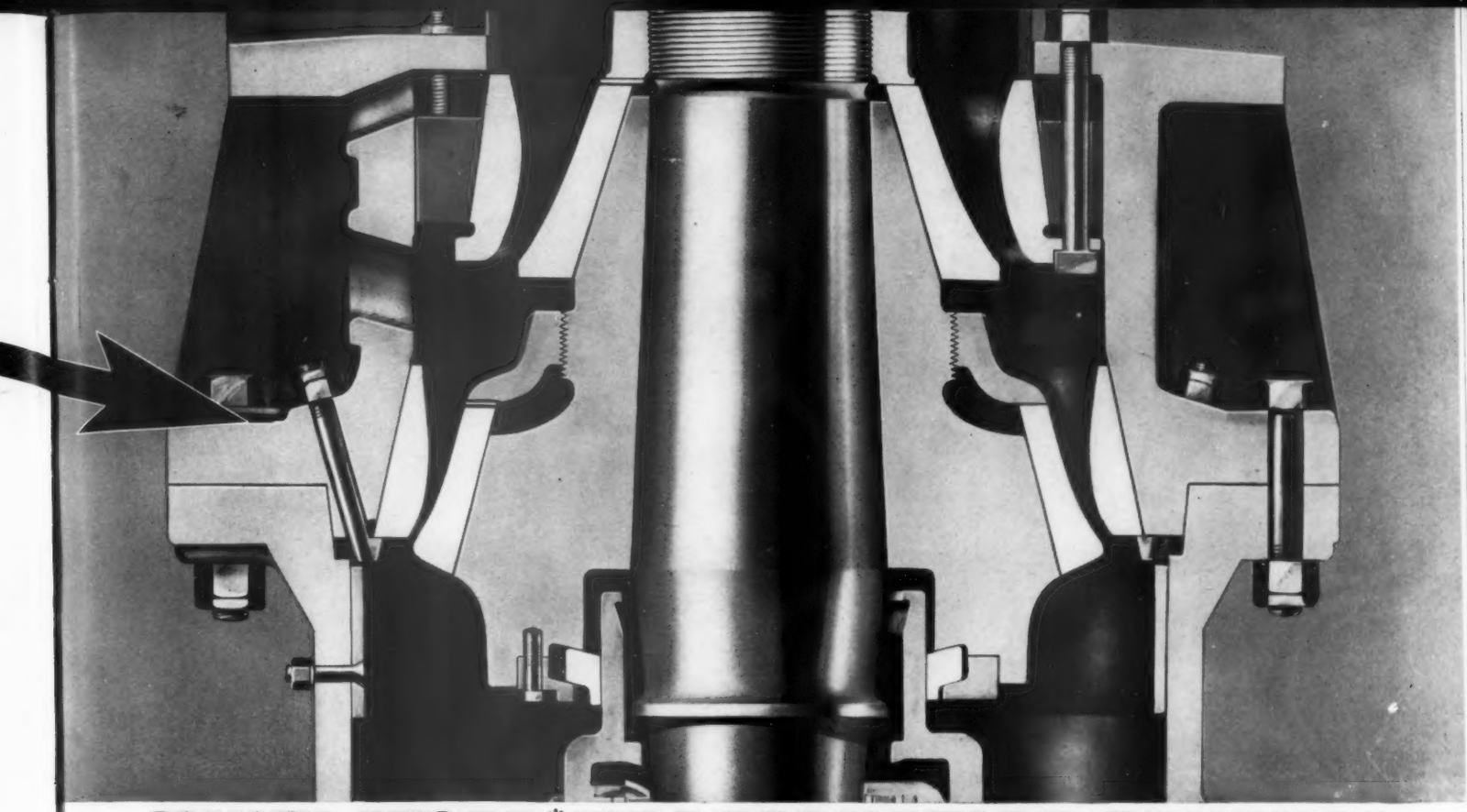
You can get higher concentrates with less floor space with Deister PLAT-O Concentrating Tables.

THIS DOES THE TRICK

ANY crusher operates at maximum efficiency when the feed is of uniform size constantly supplied to full capacity. In the Traylor-Stearns Multi-Stage Fine Reduction Crusher, the Upper Stage does about 50% of the crushing desired, and, IN ADDITION, supplies the Lower Stage with exactly the right quantity of a sized feed, distributed all around its crushing chamber, to enable the latter to operate at full capacity. The adjustment of the Upper Stage is independent of that of the Lower Stage, which determines the finished size of product of the crusher.

Other Features include-

Non-Chokable at any setting
More output per horsepower
Pat'd. Bell Head and Curved Concaves
Easy Adjustment Devices
Shock Absorber Suspension
Automatic Force Feed Lubrication
Absolute Dust Exclusion
Roller Bearing Countershaft
Cast Steel Frame



MULTI-STAGE* FINE REDUCTION CRUSHER

THE BEST CRUSHER "BUY" FOR 5/16" AND LESS

●

RESULTS COUNT MOST

Following are four examples, taken at random, of results secured with 3'0" machines.

MATERIAL CRUSHED	CLOSED SETTING LOWER STAGE	TPH	HP	PER CENT THRU — SQUARE HOLES					
				3/4"	1/2"	3/8"	1/4"	10M	100M
LIMESTONE	7/16"	62	58	86	49	31	19	3	1
SANDSTONE	3/16"	68	63	97	86	69	44	20	9
GRAVEL	7/16"	67	65	90	64	47	34	14	5
TRAP ROCK	5/16"	72	55	99	67	40	21	12	8

Take particular note of the horsepower used. The product in all cases is cubical and remarkably free from slabs.

*U. S. Pat. No. 2,147,721

SEND FOR A COPY of

BULLETIN 113

TRAYLOR

ENGINEERING & MANUFACTURING CO.

MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

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B. C. EQUIPMENT CO., LTD. 551 Howe St., Vancouver, B. C. | MANILA MACH. & SUPPLY CO., INC. Manila, and Baguio, P. I. | MAQUINARIA INTERNACIONAL, S. R. L. Av. Francisco I. Madero No. 17, Desp. 214, Mexico, D. F.

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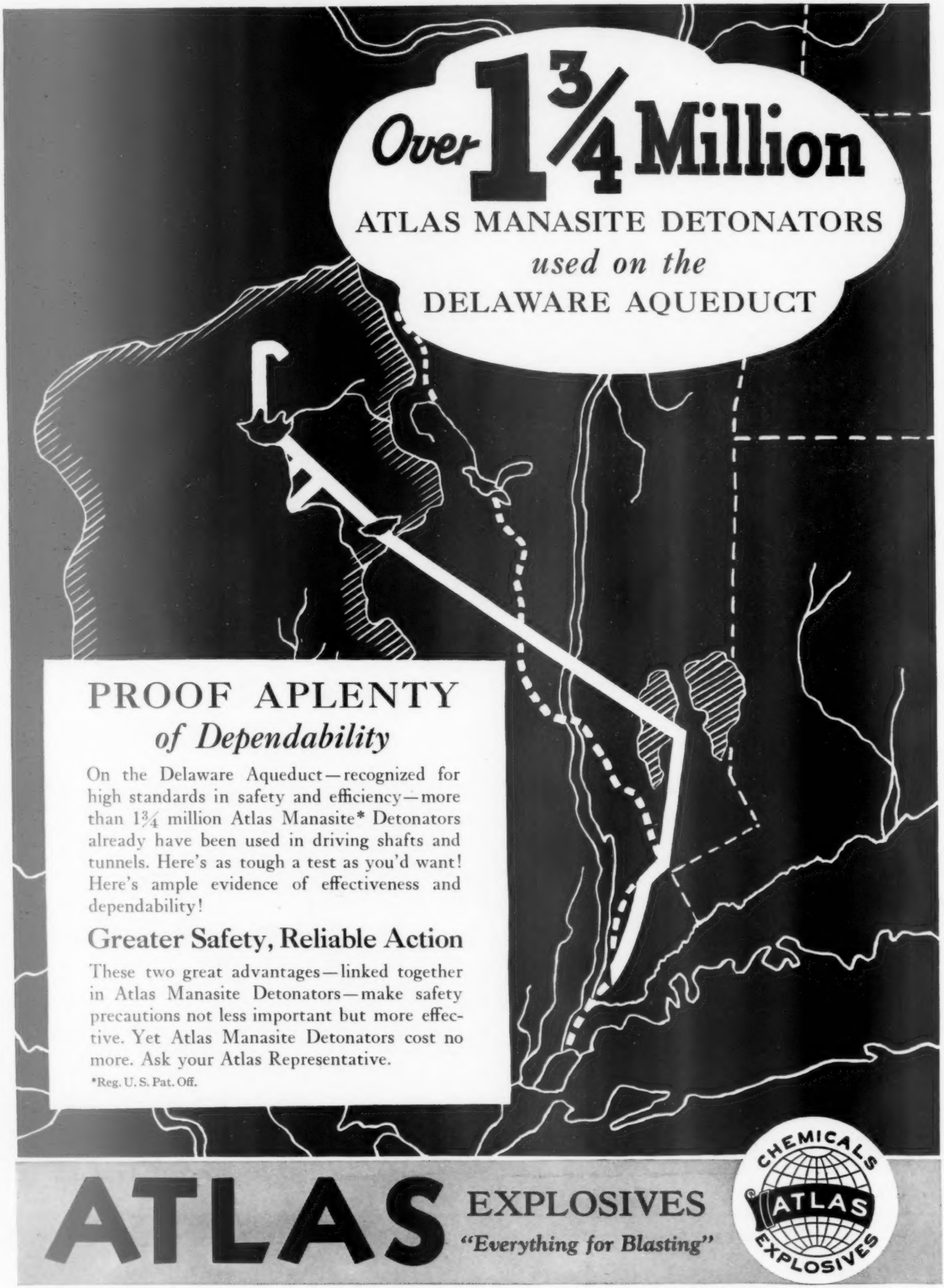

PROOF APLENTY
of Dependability

On the Delaware Aqueduct—recognized for high standards in safety and efficiency—more than 1¾ million Atlas Manasite* Detonators already have been used in driving shafts and tunnels. Here's as tough a test as you'd want! Here's ample evidence of effectiveness and dependability!

Greater Safety, Reliable Action

These two great advantages—linked together in Atlas Manasite Detonators—make safety precautions not less important but more effective. Yet Atlas Manasite Detonators cost no more. Ask your Atlas Representative.

*Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. · Offices in principal cities · Cable Address—Atpowco

The list of Fuller Air-Quenching Cooler installations is still growing rapidly . . many good reasons for the popularity and general acceptance of this latest, efficient cooler, a few of which are: Mechanical simplicity . . . first cost low . . . comparatively little maintenance . . . operation under direct observation . . . low power requirements . . . high and uniform combustion air temperatures . . . production of clinker of high glass content . . . uniformly well burned clinker.

Our engineers are at your service . . . no obligation to you . . . let us know what you have in mind.

FULLER COMPANY
CATASAUQUA, PENNA.
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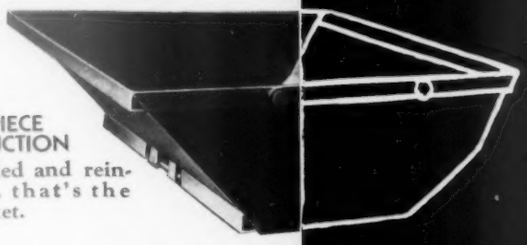
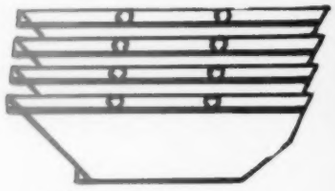
San Francisco: 320-321 Chancery Bldg.

CO-7

Here's PROOF....



ONE-PIECE CONSTRUCTION
. . . all welded and reinforced . . . that's the Brooks Bucket.



NESTED BUCKETS
Convenient when carrying empties.

NO COUNTERWEIGHTS NO STRAIN ON FRAME
Jack-leg supports overhang when loaded bucket is being hoisted.

OPEN-END BUCKET
Special type for particular applications.

FAST DUMPING — Only 15 seconds for dumping bucket or picking up loaded bucket.

Why Brooks LOAD LUGGER

Trade-Mark Registered

leads the way to LOWER COSTS

It is engineered down to the last detail to give you a new high in speed, economy and service.

Powerful double-cylinder hoist . . . trigger-quick control from cab . . . simple, compact design. It has correct load distribution, and extremely low headroom. The frame is welded into a complete, inseparable unit, and reinforced with structural steel members.

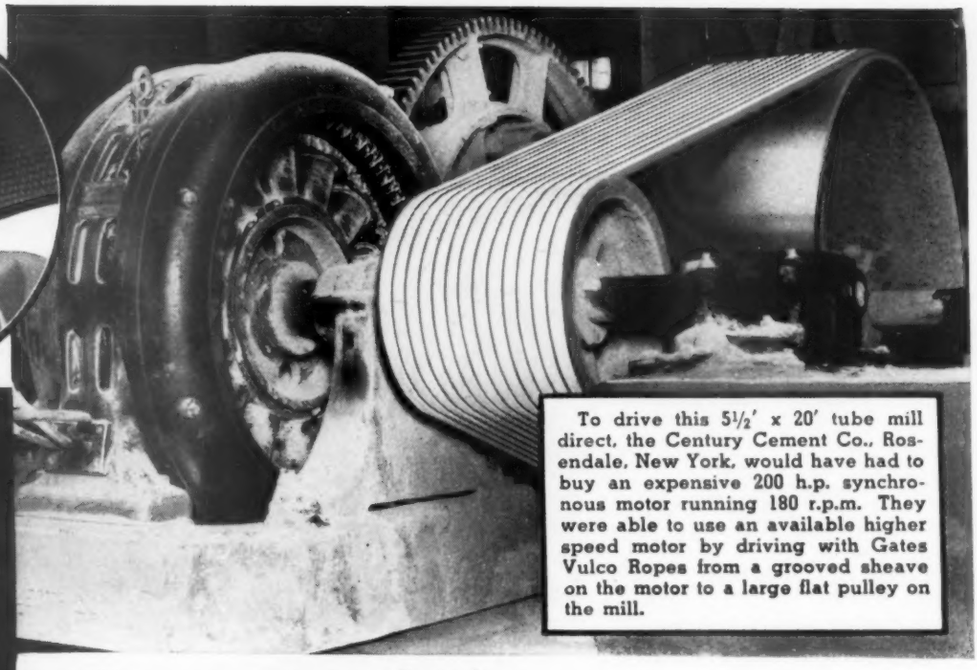
Why not multiply your truck efficiency by mounting a Brooks LOAD LUGGER on the chassis! Then you can maintain a continuous stream of material from quarry to crusher or from pit to stockpile.

Brooks LOAD LUGGER System, with a set of buckets, can save you 50% to 60% on hand loading jobs.

For further proof, test the Load Lugger on the job . . . Ask about our Special Introductory Offer.

Brooks EQUIPMENT AND MFG. CO.

Distributors in All Principal Cities **KNOXVILLE 102 Davenport Road TENNESSEE**



To drive this 5½′ x 20′ tube mill direct, the Century Cement Co., Rosendale, New York, would have had to buy an expensive 200 h.p. synchronous motor running 180 r.p.m. They were able to use an available higher speed motor by driving with Gates Vulco Ropes from a grooved sheave on the motor to a large flat pulley on the mill.

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

If You Care About *Operating* COSTS

MAKE THIS *easy* TEST

In two minutes you can prove for yourself a simple fact that will reduce your V-belt costs and power costs.

Pick up *any* V-belt. Bend it as it bends when it goes around its pulley. As the belt bends, grip the sidewalls with your fingers. You will *feel* the *sides* of the belt *change shape.* If the belt you are testing were built with *straight* sides, the bending would force those sides to bulge out—as shown in figure 1. (upper left).

Now make this same test with a belt that is built with the patented *concave* side. You will again feel the sides change shape with this *important difference:* The concave side becomes perfectly straight. This belt, when bent, takes a shape that exactly fits its sheave groove (see figure 2).

Here are the savings. First: no outbulge of the sides means uniform sidewall wear—longer life for the belt. Second: The full side of the belt uniformly gripping the sheave wall will carry heavier loads without belt slippage—a saving in belt wear and also in power!

The Gates Vulco Rope is the only V-belt built with the patented concave side.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 1524 South Western Ave.
HOBOKEN, N. J. Terminal Building
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DENVER, COLO. 999 South Broadway
DALLAS, TEX. 2213 Griffin Street
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GENERAL

gives you More of the things necessary to maintain high production, as it is doing here for Hannaman & Burroughs of Salisbury, Md. The machine is unloading stone at Berlin, Md., for a new road near Ocean City.

MORE ROCK— MORE HIGHWAYS

This GENERAL Model 307 Clamshell Crane is going right down the line of cars, keeping trucks and cars on the move.

Let the GENERAL help you keep material on the move.

The **OSGOOD** COMPANY
Sizes: ½ to 2½ Cu. Yd.
Diesel - Oil - Gas - Electric
Associated with
The GENERAL EXCAVATOR CO.

The **HERCULES** COMPANY
HERCULES
IRONEROLLERS
6 to 12 Tons
Diesel or Gasoline
Associated with
The GENERAL EXCAVATOR CO.

GENERAL

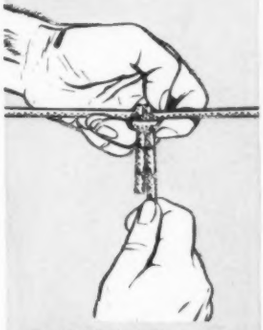
OSGOOD MARION OHIO U.S.A. GENERAL HERCULES

Sizes:
⅜-½-⅝-¾ Cu. Yd.
Diesel—Gas—Electric

SHOVELS
DRAGLINES - CRANES
Crawler & Wheel Mounted

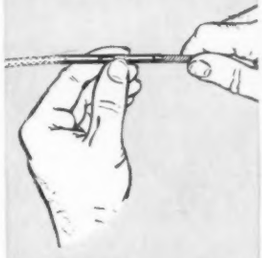
THE GENERAL EXCAVATOR COMPANY, Marion, Ohio

1. Tie through cartridge.



2. Half hitch branch to main line.

3. Connect main line lengths with *square* knot.



4. Fuse and cap on end of main line.

IMPORTANT

Branch lines should lead away from main lines at *right angles*. Avoid kinks and small loops.

For well drill holes

Primacord will save you money. It consists of a core of PETN* enclosed in a flexible, waterproof textile covering. Because it detonates each cartridge in the drill hole, you get *more work* from your explosives, for each cartridge has the added force of a primer cartridge. And because it is used to connect all holes, you can plan the firing rotation to relieve burden, and get *better work* from your blast. Thus you save time, labor, money; and also reduce hazard. Send for the Primacord Book.

PRIMACORD BICKFORD
Detonating Fuse

*PENTAERYTHRITETETRANITRATE

PB29

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836

HUG TRUCKS *for*

DEPENDABLE TRANSPORTATION

HUGS have proven their ability in the heavy transportation field for over twenty years, furnishing dependable transportation for quarries, cement, stripping and dirt moving operations.

ENGINEERED for your job, and built to meet your conditions, Hug trucks provide capacities to fit your job and the easy maneuverability necessary for continuous production. Such dependable transportation provides a maximum amount of work at a minimum cost.

For operating costs or performance data, write today and have a Hug representative survey your plant at no expense or obligation on your part.

THE HUG COMPANY

★ HIGHLAND, ILLINOIS ★

FLOTATION AT NATIONAL

(Above) Interior of the cell house. The first three Fagergren cells of the center row are concentrating graphitic carbon, the remainder are concentrating lime. (Below) The raw-material processing plant at the mill of the National Portland Cement Co.

We design, equip and supervise the erection and starting of complete cement raw-material processing plants. Our laboratory and pilot plant are fully equipped to make complete investigations of your materials—including the removal of alumina and alkali minerals from clays and shales—on either an experimental or semi-commercial scale. Write us for recommendations.

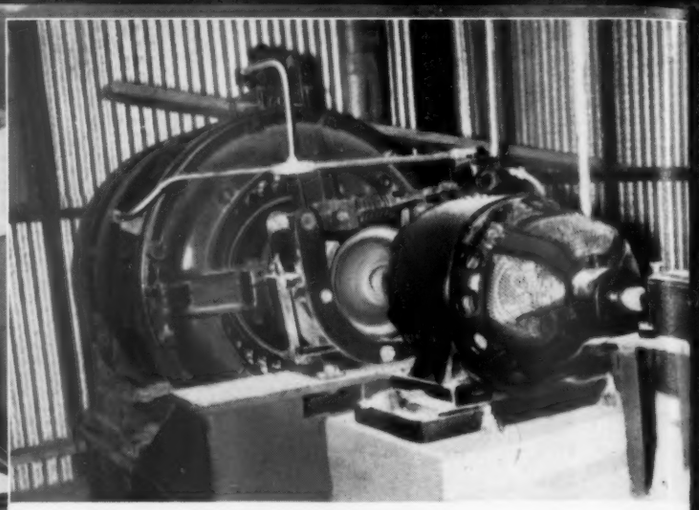
THE 8TH PLANT TO USE THE BREERWOOD PROCESS

Cement compositions meeting all present specifications can be produced in the plant of the National Portland Cement Company. Preparation of kiln feed from its quarry rock, below composition in lime, is accomplished by a novel combination of centrifugal sedimentation and froth flotation—the first commercial installation of this improvement of the Breerwood Process. The process plant produces two products which can be blended in the proper proportions with untreated slurry for the production of various types of cement. Kiln feed for the manufacture of its commercial cement is produced by processing only about half of the tonnage of its average rock. A centrifuge separates this half into about equal parts, one of which is an improved product. The remaining quarter of the tonnage is processed by flotation. Re-mixing the centrifuge and flotation products with the untreated half of the slurry effects the correction.

All patent rights, except in North America, are controlled by F. L. Smidth & Co., A/S., Copenhagen.

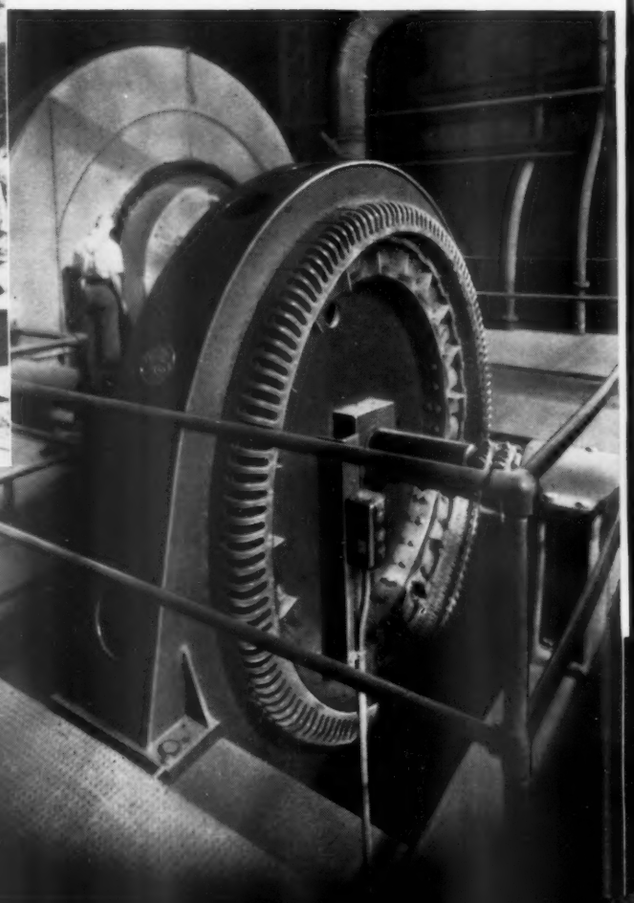
SEPARATION PROCESS COMPANY

CATASAUQUA, PENNSYLVANIA



ADJUSTABLE-SPEED, ALTERNATING-CURRENT KILN DRIVES. This picture shows the G-E 200-hp Type BTA brush-shifting a-c motor driving the No. 3 kiln. The motor has a range of dependable speed adjustment of three to one. Changes in kiln load will not cause it to speed up or slow down appreciably. Push the "Start" button, and the motor goes automatically to a preset speed.

DIESEL-ELECTRIC LOCOMOTIVES FOR SWITCHING. This G-E 43-ton switcher at Permanente hauls loaded cars to the interchange yard, returns empties to the loading zone, and does general switching. Easy to operate and providing excellent visibility, its remarkable performance record is evidenced by amazingly low maintenance costs (including track maintenance), low fuel costs, and by its constant availability for service.



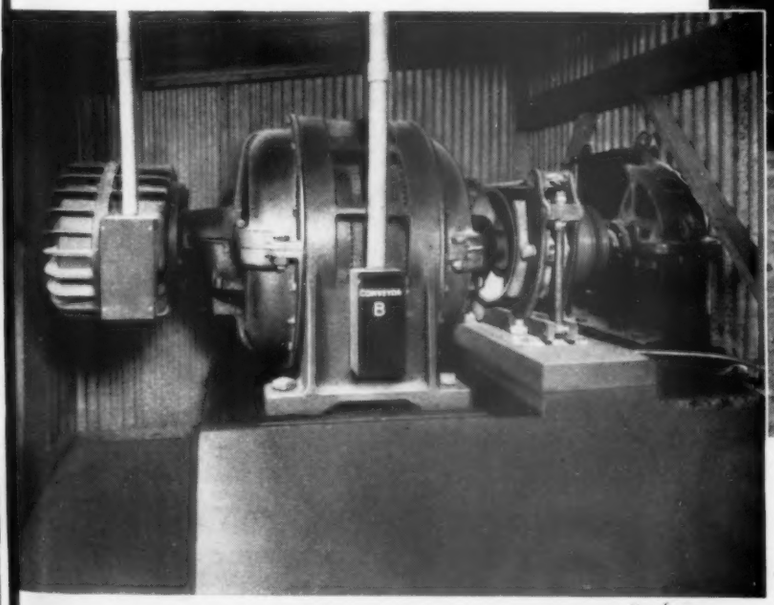
SYNCHRONOUS MOTORS WITH HIGH-STARTING-TORQUE WINDINGS FOR DRIVING BALL AND TUBE MILLS. There are four G-E 1000-hp and eight G-E 500-hp motors of this type at Permanente. They meet the requirements of ball- and tube-mill service and provide the necessary leading power-factor to bring the power-factor of the entire plant to unity, thus enabling Permanente to realize maximum economy in power costs and highly satisfactory motor operation.

A Few Ideas from PERMANENTE about Electric Equipment for Cement Plants

THE electric equipment shown here may give you some helpful ideas because the applications and uses described are fairly new to the cement industry. It is in service at the new 10,500-bbl-a-day plant of the Permanente Corporation near San Jose, Calif. It contributes to the continuity and economy of operations and provides impressive evidence of General Electric's ability to meet the exacting electrical requirements of modern cement production. Let our nearest representative help with yours. General Electric, Schenectady, New York.

• • •

Note: G-E equipment at Permanente includes approximately 10,000 hp of motors (ranging from 1/50 to 1000 hp in size), numerous motor-generator sets, control equipment, stepdown transformers, main circuit breakers, the 2300-volt switchboard, the electric equipment for the quarry power shovel, thousands of feet of high-voltage cable, and the diesel-electric switching locomotive.

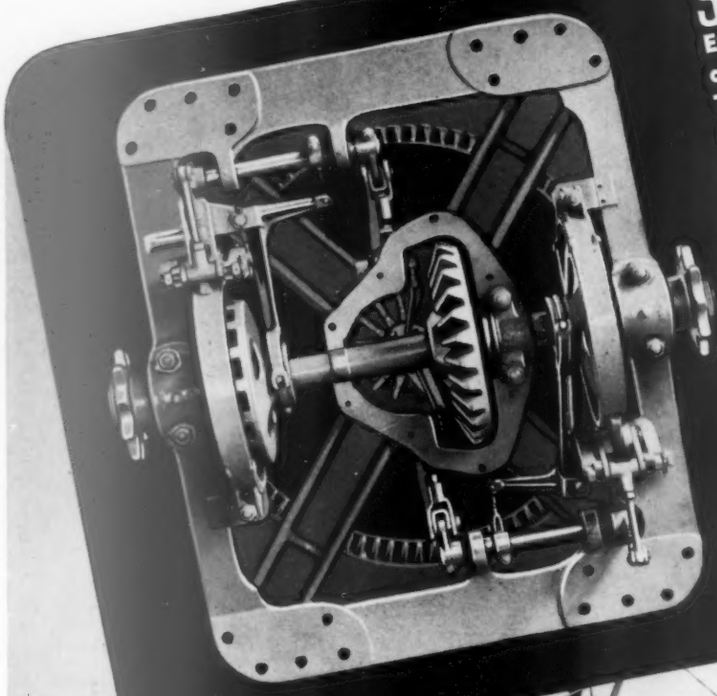


MOTORS FOR REGENERATIVE BRAKING OF SLOPE CONVEYORS. This is the G-E 200-hp wound-rotor motor on the center section of the mile-long belt conveyor that brings rock from the quarry to the mill. Because the rock moves downhill most of the way, the chief functions of this motor and of those on the other two sections are to start and brake the conveyor. The overhauling load actually turns these motors into generators, which provide regenerative braking and close speed control while generating continuously about 300 kw of electric energy.

GENERAL ELECTRIC

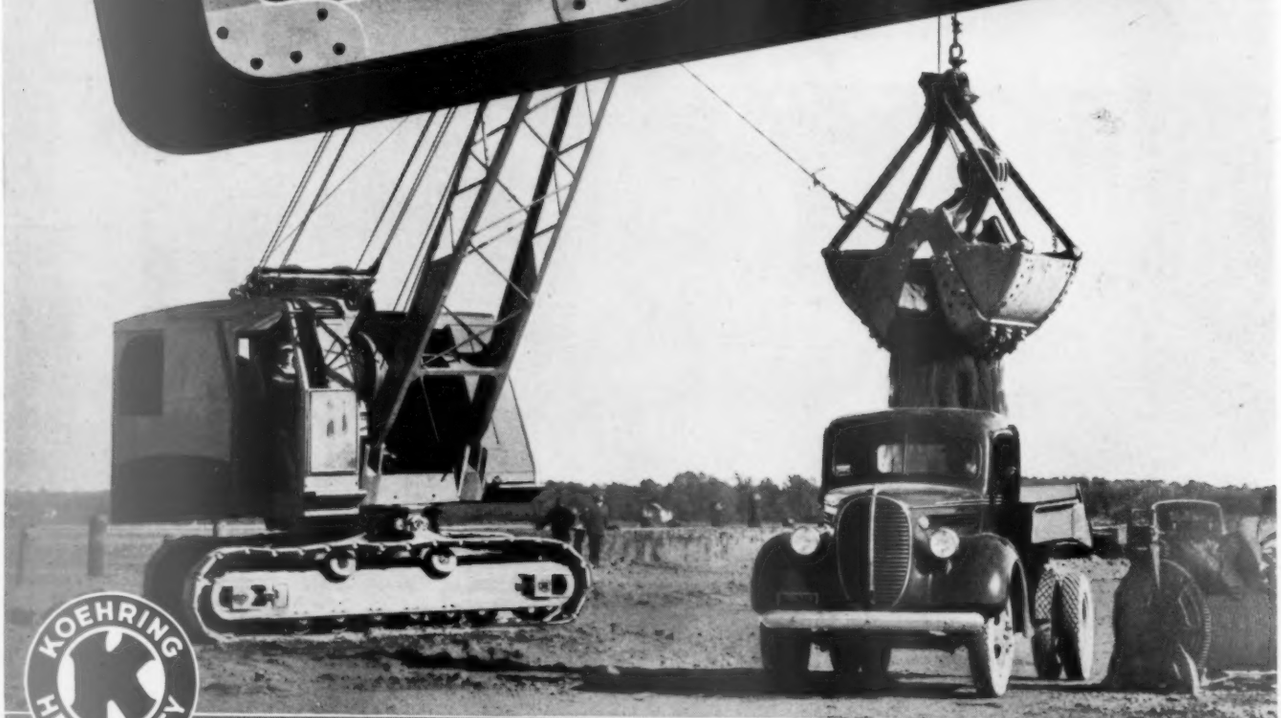
652-6

TWO GEARS IN LOWER TRACTION



STEERING and traction control is easy and positive on Koehring Excavators. Only two gears are required for the lower traction drive. This simplicity of construction assures a low maintenance cost. A dirt-tight case houses these gears, which run in oil. Two multiple jaw clutches, operating independently connect the driving shaft with the crawlers. Either crawler can be partially or wholly locked for steering. Both can be locked against traction movement. All movements are easily controlled by the operator. Koehring Excavators can be quickly moved and positively controlled . . . cutting lost time and providing stable operation.

KOEHRING COMPANY
MILWAUKEE . WISCONSIN



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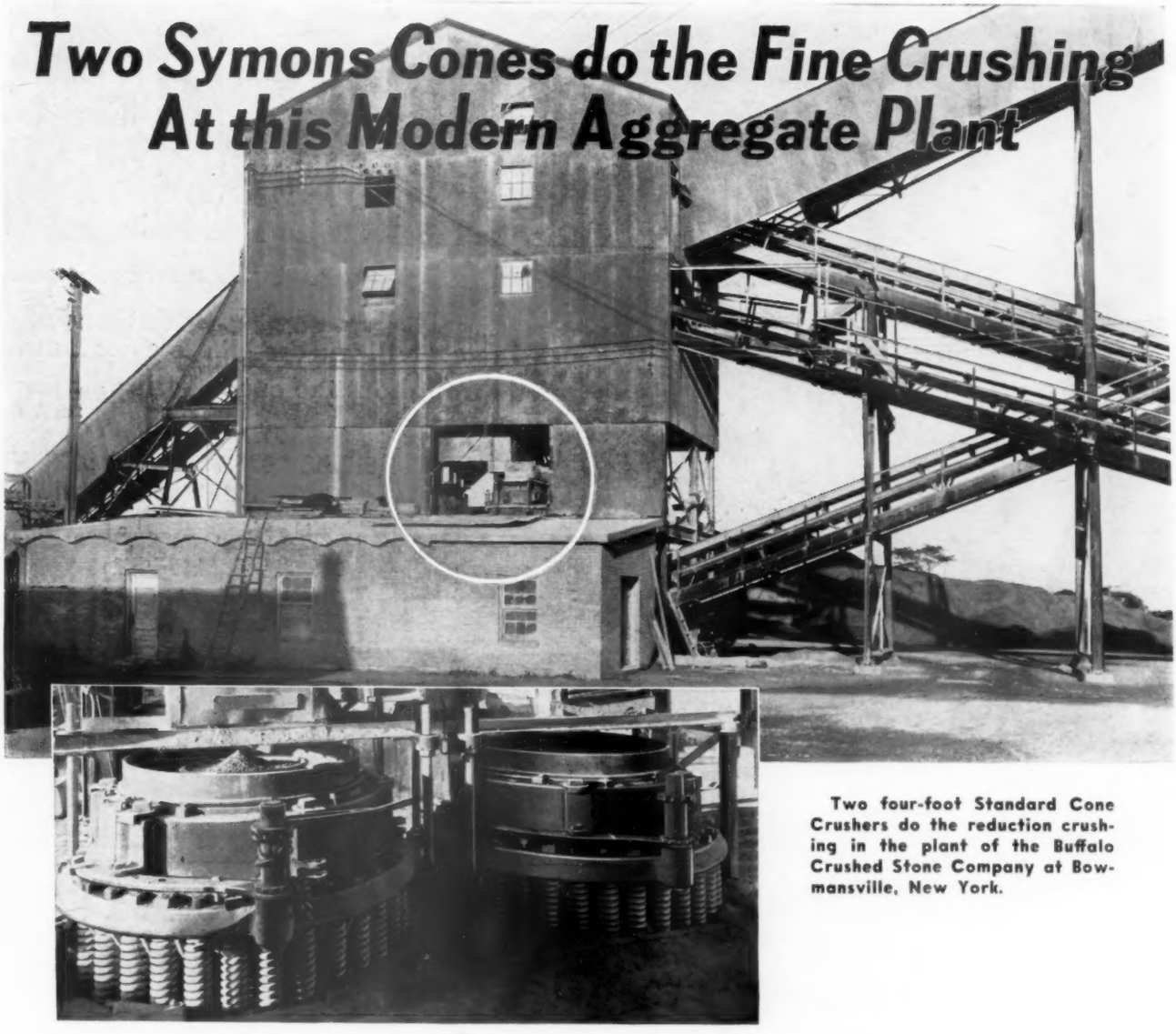

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No reduction crusher ever received such universal recognition amongst producers of finely crushed materials as has the Symons Cone. The use of this crusher at the Buffalo Crushed Stone Company is typical of the many installations in larger aggregate plants, especially where minus half inch products are required. For making these finer sizes, the Symons Cone is without equal for capacity and low cost per ton crushed. Two types are available—the Standard Cone, as shown above, and the Short Head for making the extremely fine sizes. There is a type and size of Cone suited to your material and your product requirements. If you have a fine crushing problem, let us show you how this can best be solved with a Symons Cone.

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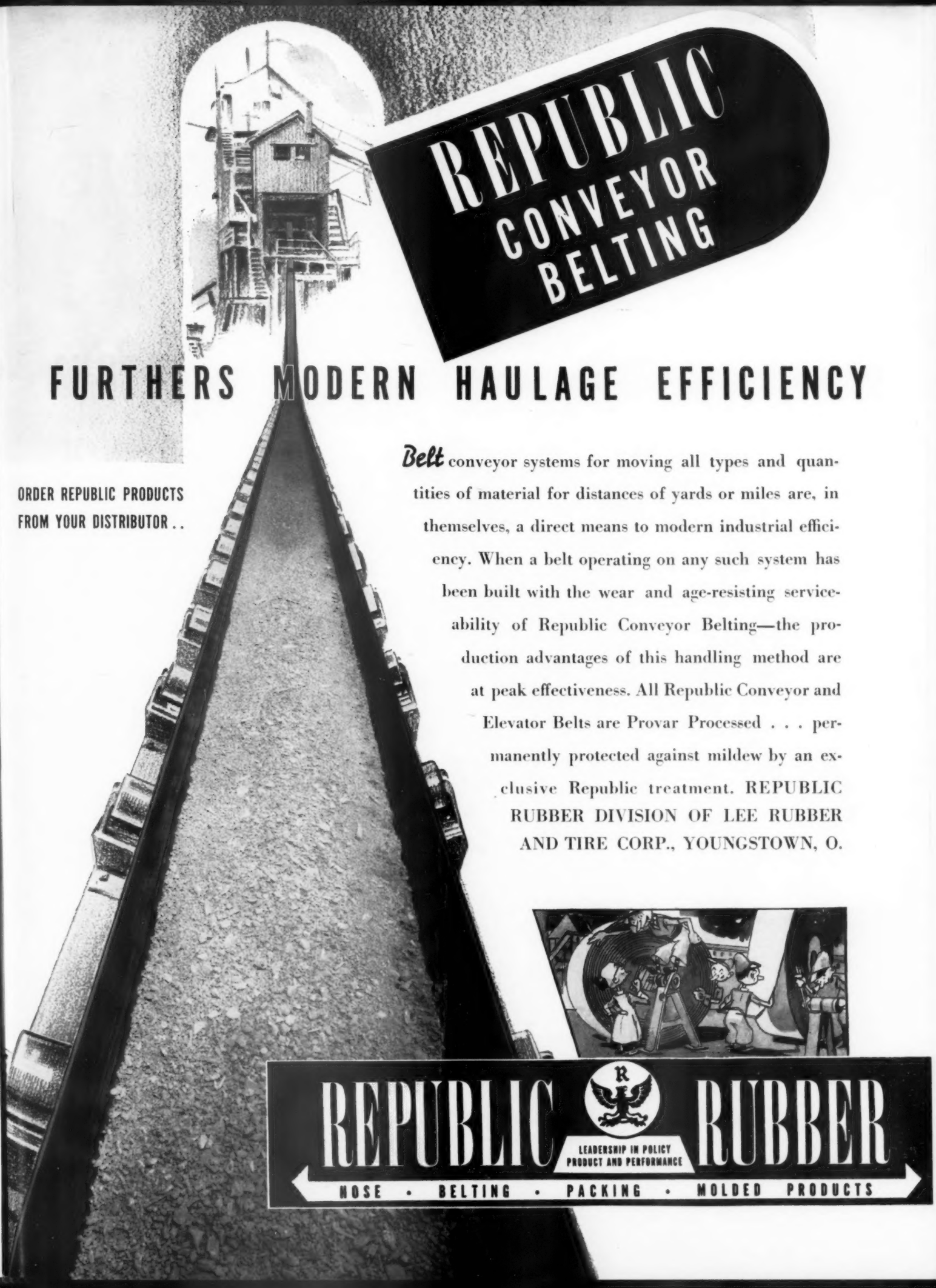

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PIT AND QUARRY

Vol. 33 FEBRUARY, 1941 No. 8

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Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals.

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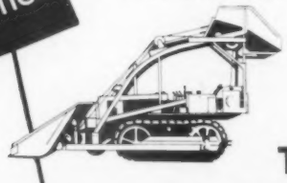

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PIT AND QUARRY

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Precedent Set by Supreme Court in Silicosis Ruling

The Supreme Court on January 6 held that a Federal District Court which has decided litigation in conformity with existing state law should change its decision if the state law is subsequently altered.

Justice Reed delivered the opinion, which further clarified the tribunal's far-reaching decision in 1938 that "except in matters governed by the federal constitution or by acts of Congress the law to be applied in any case is the law of the state." No dissent was announced.

The question of what the federal courts should do when a state Supreme Court reverses former rulings—thus changing state law—was presented in an appeal by Virginia Vandenbark of Newark, Ohio, seeking damages from the Owens-Illinois Glass Company of that city on the ground that she had contracted silicosis and other occupational diseases in 1935.

The petition was dismissed by the Federal District Court at Toledo on the ground that there was no cause of action under Ohio law.

A few months later, while the case was pending on appeal before the sixth Federal Circuit Court, the State Supreme Court reversed former decisions and held there was a right to recover. The state legislature also made silicosis a compensable disease under the Workmen's Compensation Act.

The Federal Circuit Court ruled that a State Supreme Court decision cannot be given a retroactive effect "so as to make that erroneous which was not so" when a Federal District Court opinion was delivered.

TVA Plans Phosphate Plant in Tennessee

The T.V.A. is about to develop a phosphate plant adjacent to the L. & N. Railway, near Godwin, Tennessee, which will have a capacity of 16,000 tons of phosphatic material each month.

H. R. Mosley of Columbia, Tennessee, is slated for the management of the plant.

Dredge Being Widened at Neville Island

The Iron City Sand & Gravel Corporation, Pittsburgh, has run its dredge *Elizabeth Pfeil* onto the Dravo Marine Ways, Neville Island, near Pittsburgh.

Here the dredge, 160 feet long and 7 feet deep, will be widened from 40 feet to 46 feet.

Coming Events

February 10-12, 1941—Chicago. Annual conventions, National Concrete Masonry Association, American Concrete Pipe Association, National Cinder Products Association, Sand-Lime Brick Association, and Cast Stone Institute.

February 18-20, 1941—Washington. Annual convention, American Concrete Institute, Mayflower Hotel.

April 23-25, 1941—Hot Springs, Virginia. Convention, Concrete Reinforcing Steel Institute, Homestead Hotel.

May 27-29, 1941—Hot Springs, Virginia. Annual convention, National Lime Association, Homestead Hotel.

June 23-27, 1941—Chicago. Annual meeting, American Society for Testing Materials, Palmer House.

Porter Gifford, Head of Texas Operating Group, Dies at 55

Porter William Gifford, 55, president of the Gifford-Hill Construction Company, died January 7 at his home in Dallas.

A native of Davenport, Iowa, Mr. Gifford began his business career at the age of 17 as a timekeeper for a railroad contractors' firm. He later became bookkeeper and superintendent of construction for the Walsh Construction Company. He helped form the Walsh, List & Gifford Construction Company, of which he was vice president until 1904, when the List & Gifford Company was begun in Kansas City.

Mr. Gifford was vice-president of that concern, and in that capacity first went to Dallas in 1917 on a grade-separation project. He remained in Dallas until the dissolution of the company in 1924. He then organized a company of his own and concentrated, along with construction, in the production of sand, gravel and crushed stone.

With J. Rutledge Hill, Mr. Gifford organized the Gifford-Hill Company in 1926, and became president of the concern. At the time of his death he was president of Gifford-Hill & Company, Gifford-Hill Concrete Pipe Company, Coastal Plains Supply Company and of the Evangeline Railway.

He was also a director of the Dallas Concrete Company, Trux-Mix Concrete Company and the North Texas Materials Company.

Canada Cement Earns $1,332,220 in 1940

The Canada Cement Company, Ltd., and subsidiaries report for the fiscal year ended November 30, 1940, net profit of $1,332,220, equal after dividend requirements on 6½ per cent. preferred stock, in arrears, to 4 cents a share on the common. This compares with $1,475,648 or 28 cents on the common stock in the preceding year.

Voters Oppose Any Diversion of Funds Ear-Marked for Roads

Proposals affecting highway taxes in several states met varied fates in the November elections, but one type of measure—that preventing diversion of highway funds by constitutional amendment—emerged triumphant in every test.

The voters of Idaho, Nevada and South Dakota all approved such measures. Returns from Idaho indicated that the "road protection" amendment was carried by a majority of 3 to 1. A similar amendment in Nevada was approved by nearly 4 to 1, and in South Dakota, the so-called "better and safer roads" amendment passed, though by no such margin as in the other two states.

Favorable action by these three states brings to 11 the number that now prevent diversion of their highway funds by constitutional amendment. Missouri, Kansas and Minnesota adopted such amendments prior to 1935. Colorado approved an amendment that year, and California, Michigan and New Hampshire adopted amendments in 1938. At a special election in June, 1940, North Dakota took similar action. Similar amendments are pending in other states.

Although Missouri is the only state in the Union with a 2-cent gasoline tax, two proposals to increase the tax to 3 cents were defeated in the recent election. One such amendment would have, in essence, reduced registration fees on passenger vehicles by 25 per cent, credited ½ cent of the increase in the gas tax to a county road fund, eliminated local gasoline taxes, and credited the other ½ cent increase to the municipalities of the state. The other amendment differed from this primarily in retaining present passenger-vehicle registration fees for a 10-year period and in using the ½ cent that would have gone to the counties under the first amendment to establish a system of "rural service" roads, a notch below the present system of state supplementary roads, under the administration of the state highway commission.

Iola Workers Reject Union, 60 to 39

Employees of the Iola, Kansas plant of the Lehigh Portland Cement Company have rejected a proposal that the United Cement, Lime and Gypsum Workers be named exclusive representative for collective bargaining at the plant.

A secret ballot indicated the vote was 60 to 39 against the proposal. A representative of the National Labor Relations Board presided at the counting of the ballots.

General representatives, specialty salesmen and district sales managers of the Missouri Portland Cement Company met at the Hotel Coronado in St. Louis on January 13 and 14 in an annual sales convention which this year is dedicated to the company's fiftieth anniversary. The concern, which supplies standard, high-early-strength and masonry cement in the midwestern area, was formed June 3, 1891, at St. Louis.

Slag Association Holds Meeting at Birmingham

The National Slag Association, at its annual meeting held January 17 and 18 at the Tutwiler Hotel, Birmingham, elected George A. Mattison, Jr., of Birmingham president and L. E. McDermut of Chicago vice-president for the current year.

H. J. Love and T. E. Sheafer continue as managing director, treasurer and secretary, respectively. They are located at the association's offices in the Earle Building, Washington, D. C.

Would Have Wisconsin Convicts Make Cement

Assemblyman Elmer Genzmer, Mayville, has announced that he is introducing in the Wisconsin legislature, which opened January 8, a bill to establish a state-owned cement plant at Waupun, to be operated by prisoners at the state penitentiary there.

Besides manufacturing Portland cement, the plant would produce gravel and other road materials, according to Mr. Genzmer, who stated that the cement would be used solely for state highways.

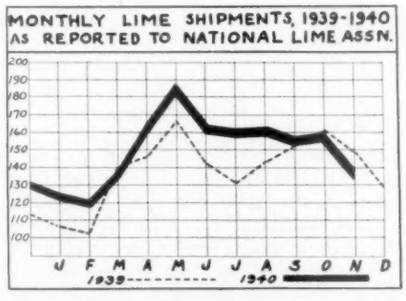
EMPLOYMENT AND PAY-ROLLS

(Compiled for PIT AND QUARRY by Isador Lubin, Commissioner of Labor Statistics, U. S. Dept. of Labor.)

Industry	Establishments	Number of Employees	Pay Rolls (1 week)
Cement:			
October, 1940	134	22,282	$630,443
November, 1940	134	21,763	608,468
Percentage change		—2.3	—3.5
Quarrying and nonmetallic mining:			
October, 1940	912	31,736	755,516
November, 1940	912	30,826	688,578
Percentage change		—2.9	—8.9

Will Use Coal Instead of Gas to Fire Kilns

Two of the lime companies at Beachville, Ontario, have been asked by the Dominion Natural Gas Company to make necessary alterations in plant equipment whereby they use coal in place of natural gas in the burning of lime. The order was issued because of the serious shortage of natural gas which has developed throughout the Western Ontario area and which has been investigated by the Ontario Department of Mines.



According to data collected by the National Lime Association, 72 companies in November, 1940, shipped 133,642 tons (89,311 quicklime; 44,331 hydrate). Reporting companies represent 51.8 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry the total shipments for the month are estimated to have been approximately 260,000 tons. Shipments of lime by use and grade for November, 1940, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	350	2,011
Building	14,833	24,575
Chemical	74,128	17,745
Total	89,311	44,331

Aggregates Shipments to Show Sharp Rise in Initial Quarter

An increase of 22.9 per cent. in freight-car loadings of gravel, sand and stone during the first quarter of 1941 over the corresponding period a year ago is indicated by estimates compiled by the thirteen Regional Shippers' Advisory Boards.

On the basis of these estimates, freight-car loadings of gravel, sand and stone will reach 212,259 during the initial 1941 quarter, compared with actual loadings of 172,643 in the same 1939 period.

The estimates also indicated a 14.4 per cent. increase in car-loadings of cement, rising from 73,220 in the initial quarter a year ago to 83,788 this year. Brick and clay products are expected to show a 30.0 per cent. gain from 42,713 to 55,531 cars. Shipments of lime and plaster are expected to increase 14.0 per cent. during the quarter, from 30,522 to 34,792 cars.

Three Universal Atlas Plants Accident-Free

Perfect safety records were made in 1940 at the Universal, Pennsylvania, Independence, Kansas, and Leeds, Alabama, plants of the Universal Atlas Cement Company, subsidiary of United States Steel Corporation. Each of these plants went through the calendar year of 1940 without a single lost-time accident and will be reawarded the Portland Cement Association Safety Trophy. Since 1925 the nine plants of the Universal Atlas Cement company have been awarded this trophy 36 times.

These safety records of cement plants and their quarries are made in the face of such hazards as trucks and locomotives; high voltage and highly explosive materials; heavy crushing and grinding machinery; conveyors, cranes, and quarry shovels. Yet industrial safety has been so developed that fewer employees are hurt inside the plant gates than outside. This organized safety effort not only prevents accidents and loss of time to workers, but also keeps their families free from worry and loss of income due to accidents.

Law Forbidding Removal of Beach Sand Upheld

Municipal Judge E. R. Burgess of Racine, Wisconsin, upheld the city's ordinance which prohibits removal of sand from the beach of Lake Michigan from within 150 feet of the water's edge and ruled that Henry Gloede, Jr., Ted Langenfeld and Joseph Socha, local excavating contractors, had removed sand in violation of the law.

The court suspended sentence in each case because "the city of Racine itself removed sand from the beach and the defendants for a number of years removed sand from the beach without any protest on the part of the city of Racine."

Judge Burgess held that it was within the power of the city council to enact the ordinance, that it does not conflict with any state law and that the ordinance is not unreasonable.

A group of citizens living on Racine's north side brought action against the contractors to put a stop to the sand removal. The Wisconsin Public Service commission recently held a hearing in Racine in the matter but its decision is still pending.

15 Milwaukee Firms Sued as "Monopoly"

The William F. Luebke Co., Milwaukee, has filed a $75,000 action in Federal court against fifteen Milwaukee building-supply firms, charging them with operating a monopoly in violation of the Sherman anti-trust act.

The complaint alleges defendant firms do 90 per cent of the $5,000,000 annual business in building supplies in Milwaukee county and that written and oral contracts were entered into by the firms in 1936 in restraint of trade and to destroy competition.

Prices and terms of sale are fixed, and the plaintiff and others outside the combination are prevented from obtaining supplies because of boycotts or threats of boycott against manufacturers, according to the complaint. Counsel for the Luebke company charges his client was forced out of business in 1939 by the allegedly illegal combine.

A LeTourneau 12-cubic yard Carryall and a D8 Caterpillar tractor operating at the quarry of the Jesse Allen Lime Company, Inc., Burns, Tennessee. The outfit is stripping a 9,000-cubic yard bank of red-clay overburden from a new limestone section.

All Work in Excess of 40 Hours Must Be Paid as Overtime

The obligation to pay time and one-half after 40 hours, under the Fair Labor Standards Act, is not voided by the existence of a union contract calling for a workweek of more than 40 hours without the payment of overtime—except in certain instances—according to Colonel Philip B. Fleming, Administrator of the Wage and Hour Division, United States Department of Labor.

"Since the requirement that time and one-half be paid after 40 hours became effective on October 24, 1940, we have received many inquiries from union members, business agents, and employers about the status of union contracts calling for a longer workweek without the payment of overtime," Colonel Fleming explained.

"A clause providing for a workweek of more than 40 hours without the payment of overtime does not relieve the employer of the necessity of paying time and one-half in accordance with the provisions of the act.

"Such a clause will have no legal effect, although the rest of the contract may stand.

"The Wage and Hour Division will not give weight to such a clause in making an inspection to determine whether the law is being complied with by an employer. The standards fixed in the act may not be lowered by any kind of agreement."

Racine Operator Sells Quarry to Foundry

The Consumer Crushed Stone Company has sold its quarry at Racine, Wisconsin to the Standard Foundry Company, and will concentrate its operations at Ives, Wisconsin and at Crystal Lake, Illinois. The foundry company will use the quarry as a pit in which to dump slag.

According to F. B. Padley, superintendent at the Ives quarry, while some rock remains on the Racine quarry, no market big enough to absorb additional crushed stone that might be turned out exists.

Fire Causes Loss at Sand-Drying Plant

Consolidated Builders, Inc., Mason City, Washington, recently suffered fire loss at its sand-drying plant amounting to about $10,000.

The Badger Sand & Gravel Company of South Milwaukee, Wisconsin has been dissolved.

CURRENT BUSINESS INDICATORS

A new "eagle"?

Reminiscent of the NRA blue eagle of 1933 is the emblem that decorates a poster issued recently by the Defense Commission. Although no fanfare accompanied the first flutter of this new bird it does seem to be indicative of the thinking official Washington — that is, to make every city, town, village, and hamlet in the country defense conscious. To quote the President of the United States:

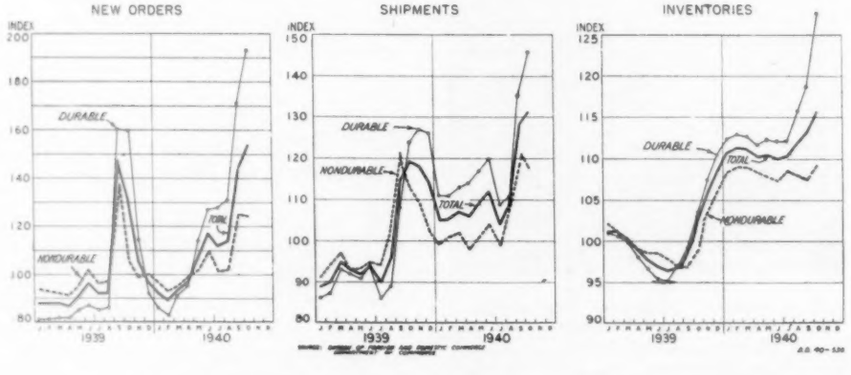
"I appeal to the owners of plants, to the managers, to the workers, to our own government employees to put every ounce of effort into producing these munitions swiftly and without stint. And with this appeal I give you the pledge that all of us who are officers of your government will devote ourselves to the same whole-hearted extent to the great task which lies ahead.

"We must be the great arsenal of democracy. For us this is an emergency as serious as war itself. We must apply ourselves to our task with the same resolution, the same sense of urgency, the same spirit of patriotism and sacrifice as we would show were we at war."

This dramatic plea, unequaled in the peacetime history of our country, comes at the close of a year during which virtually all lines of industrial activity rose to an all-time high. It is the job of industry, acting with the guidance of the War and Navy Departments and the Defense Commission, to mold this activity into a defense effort that will render this nation invulnerable to any crisis that may confront it. Particularly significant are the results of various polls showing that the vast majority of the American people, irrespective of political affiliations, are in complete sympathy with the defense aims of the Administration. Whether actual war lies ahead, as so many believe, time alone will determine. The position of the British seems more hopeful than a few weeks ago. Possibly our building what the President terms that "great arsenal of democracy" may turn the tide of battle definitely in their favor.

Production in 1940 in virtually all lines topped any previous year; outstanding were the metals, machinery, and transportation-equipment industries. As measured by the Federal Reserve Board index, business as a whole in 1940 stood at 122 (1935-39 average equals 100). By way of comparison 1939 was 108, 1937 was 113, and even 1929 was only 110. The board, recognizing that too great significance may be placed on the level of the industrial production index, cautioned that it "should not be taken as a single adequate measure of the economic well being of the nation." It went on to point out that "Especially over long periods considerable allowance needs to be made, not only for changes in the nature and quality of industrial products, but also for many other developments, including changes in other types of production, in foreign trade, in the size and composition of the population and in the division of income."

Despite this reservation in the use of production indexes the indisputable fact remains that the factories of the United States now are running at the swiftest pace on record—and this with defense spending only barely under way. It is true that contracts totalling more than $11 billions are reported to have been let but actual expenditures representative of activity in business are probably somewhere around $400 million monthly. The accelerated pace in 1940 is shown strikingly by the accompanying graphs based on data of the Bureau of Foreign and Domestic Commerce on manufacturers' new orders, shipments, and inventories. The President's budget message included $10.8 billion for the Army and Navy in the next fiscal year and an indication that expenditures might be nearly as high for at least three more years. This means a monthly outlay of close to $1 billion, or more than double the defense effort that has pushed business to its present level. Small wonder that economists and industrialists alike are staggered by the magnitude of the vistas now unfolding.



VALUE OF MANUFACTURERS' NEW ORDERS, SHIPMENTS, AND INVENTORIES 1939=100

Three General Types of Commercial Spars

Commercial feldspars are intergrowths of at least two species of feldspar and always contain accessory minerals. An infinite variety of combinations is possible, and many of the published data tend rather to confuse than to define the various market gradings. It is an oversimplification to say that there are only three or four grades, but this is essentially true.

Spar is used in glass-making primarily as a source of alumina, and either soda or potash spar is acceptable; some glassmakers prefer soda to potash. *No. 2 glass spar* must contain at least 17 per cent. Al_2O_3 and a maximum of 0.1 per cent Fe_2O_3. The minimum for total alkalies (Na_2O plus K_2O) is 11.5 per cent. For *No 1 glass spar* the free quartz content is limited to a maximum of 6 per cent. Lime is usually quite low, 2 per cent. or less CaO.

Analyses of *pottery spars* range from 73 to 65 per cent. SiO_2, 12.5 to 3.5 per cent. K_2O; 1.5 to 6.5 per cent. Na_2O, and 0.10 to 0.05 per cent. Fe_2O_3. However, high potash spar is usually preferred.

Glaze spar, on the other hand, is typically high-soda, containing 4 per cent. or more Na_2O.

With the growing consumer acceptance of feldspar mixed with quartz, it would seem that the main obstacle to marketing spar is iron content. Magnetic separation has become almost universal, but there are mixtures that cannot be cleaned up mechanically because the iron minerals are too intimately mixed with the spar to be released in coarse grinding. Iron present in the form of a stain is not so undesirable as garnet or biotite, which tends to produce specks in fired or fused products. *(Paul M. Tyler, Bureau of Mines.)*

EDITORIAL

Defense for War—II

IT seems to us unfortunate that "Aid for Britain" should have been allowed to become the rallying call for those who sincerely and unreservedly place the welfare of this nation above every other public and private interest. The phrase carries dangerous implications. It makes it appear that what is, in reality, a cry for the defense of America is only, in effect, a call for sympathetic aid to a neighbor nation.

To those who have close cultural ties with the British people this outward transfer of loyalty from America to Britain seems natural and proper. To them the two nations—in their traditions, in their beliefs, in their ideals and aims—are for all practical purposes a unit. One need not be an Anglophile to recognize the debt which democratic institutions and those who live under them owe to the British people for their long and successful struggle to establish and perpetuate the principles of freedom among men. Nor can one be rightfully accused of unreasonable partiality if, in the present emergency, he lets his belief in those principles manifest itself as a sympathetic regard for the safety of the British people and their form of government.

Among those who may harbor some secret resentment against the British government the call for "aid to Britain" may intensify such feelings. One should not be classed as an Anglophobe because he disapproves British-government policy toward the peoples of southern Ireland, India and other parts of the British empire, especially if his own government may not have acted humanely in its dealings with Haiti, Puerto Rico, and other nations. One should not be accused of undue skepticism if he suspects that much of the pleading done in Britain's behalf is not without secret and selfish interest.

Those who hope, pray and even work, openly or covertly, for the success of Germany in the present war are able to use the "aid-for-Britain" cry in a way detrimental to American interests by fanning the smoldering embers of those resentments, by winning adherents to the claim that Hitler's plans seek only the defeat of Britain and do not contemplate any harm to the United States. One may—because of a lack of information, or because of his failure to have read Hitler's own statements about his aims, or because of a ***naïve*** belief in the humanitarian impulses of human beings who have seized absolute political and military authority—believe that this nation has no interest in the outcome of the present struggle; one may believe these things and still not be consciously working against the security of America. One may, perhaps sincerely, believe—as Colonel Lindbergh, Verne Marshall and other exponents of the appeasement philosophy profess to believe—that it will make no difference to the fortunes of America or to the happiness of the American people who wins the war, that a program for a negotiated peace should be undertaken at once, even that a Hitler-dictated peace would be a fair and just one. It is because many people believe such fallacies, and, what is more important, because many, many more are in danger of being led to believe them that we consider the use of "aid to Britain" as a reason for defending our nation against Hitler a habit fraught with ominous potentialities.

It is highly important that increasing numbers of Americans and non-German aliens who live among us be made to realize that the revolution that has swept a dozen nations from the political map of Europe is no mere contest between Germany and England for a place in the economic sun. There are among us too many people who read little or nothing outside their daily newspapers, too many who boast of never having read a book, too many, in this land of widely-advertised literacy, who have no contact with the ideas of thoughtful men and women, too many persons to whom the ability to read is an accomplishment of doubtful value. We are still largely a nation of badly-informed citizens, torn between the conflicting claims of rival propaganda agencies, those operating for the British no less than those working for the Germans. Many people still find it impossible to formulate definite attitudes, to justify on logical grounds or factual bases either their indifference or their hopes for any specific result.

This situation is precisely what the author of *Mein Kampf* has described as a prerequisite to the moral breakdown of a nation and to its ultimate collapse in the face of strong military threats. Indifference, indolence of mind, lack of physical and moral courage, terror, readiness to believe the most incredible, inability to learn the truth and to form sound judgments, unwillingness to make the effort necessary to the attainment of intelligent understanding, childish reliance on a false sense of security—these are the advance agents, the mental "parachutists" who, moving freely about by virtue of the very principles of freedom which they seek to destroy, lessen our ability to recognize real danger when it threatens, to resist and overcome it when it comes, and to prevent the annihilation of the liberties which we value.

WE in America know the benefits of freedom and tolerance, even if only or principally through our observation of their opposites in other parts of the world. We know them as few other peoples besides the British know them. The course of world events has quickened our sense of their great value to us, and we are more determined than ever before to preserve them whole, to defend them against impairment or destruction from whatever direction the threat may come. That is an objective dear to most of us, an end that justifies the adoption of every means open to us. "Aid to Britain," however unfortunate the phrase may be, describes the most effective means available.

An incendiary fire of devastating and all-engulfing range sweeps over Europe. For months it has spread steadily in our direction, and now it endangers the last house but ours in its westward course toward world-wide conflagration. Fire-fighting equipment in huge quantities is urgently needed, both to save that house and to prevent the burning of our own. Shall we, then, quibble about the implications of words, such as "aid to Britain"? Shall we debate the niceties of means, when the end is the important thing to us? Shall we fight the fire now, or let the time be of the incendiary's choosing? Small we check the spread of the conflagration while it is still restrainable, or wait until it has grown beyond control? These are questions that must be answered by everyone who loves freedom.

N.S.G.A. Celebrates Its Silver Anniversary at Cincinnati Convention

CELEBRATING its twenty-fifth anniversary as an association serving one of America's most important natural-resource industries, the National Sand & Gravel Association met in convention at the Netherland Plaza hotel, Cincinnati, January 15 to 17. The exhibition of equipment, which is an annual feature of the convention, overflowed the space usually allotted to it and presented a variety of equipment surpassing that of all former years. In attendance and in the number of exhibitors this convention reflected the rising importance and prosperity of the sand-and-gravel industry.

As in former years, the annual convention of the National Ready Mixed Concrete Association, itself an outgrowth of the sand-and-gravel organization, was held at the same time, most of the sessions being devoted to matters of interest to both groups, while separate sessions were held for the discussion of matters that concerned each one alone. The report of the joint sessions and of those of interest only to sand-and-gravel producers follows; that of the separate ready-mixed-concrete sessions will be found in the *Concrete Manufacturer* section of this number of PIT AND QUARRY.

Matters of common interest were discussed at the opening session, which gave the presidents of the two associations an opportunity to review briefly the problems confronting them. President Paul P. Bird of the National Sand & Gravel Association drew attention to the work of the executive and engineering divisions of the organization. He mentioned some of the many ways in which the former, under the direction of Executive Secretary V. P. Ahearn, had helped, not only the members of the association, but the industry as a whole. A close watching of federal and state legislation having important effects on the industry's members and the prompt reporting to them of developments of significance are outstanding examples of the value of trade-association activities to the progressive producers who support them. Mr. Ahearn's membership in other organizations, his position among other trade-association executives, and his lecturing at Northwestern University on trade-association work were mentioned as evidence of the recognition given the sand-and-gravel association.

In his discussion of the work of the engineering division, headed by Director of Engineering Stanton Walker, Mr. Bird enumerated a few of the directions in which the association's activities have inured to the benefit of the entire industry. He cited Mr. Walker's membership on important technical committees, such as the American Society for Testing Materials, the American Concrete Institute, the American Railway Engineering Association, and the Highway Research Board of the National Research Council, to show the extent of the association's interest in, and effect on, the work of organizations which use or influence the use of the industry's products. Mr. Walker's position on the faculty of the University of Maryland, the establishment of the Stanton Walker fellowship there, and the close coöperation between the association and the university, where the association conducts its research and laboratory work, are examples of the ways in which the association's position has been recognized.

Left to right: E. J. Nunan, Buffalo Slag Company, Buffalo; H. V. Owens, Eastern Rock Products, Inc., Utica; H. N. Snyder, Buffalo Slag Company.

Left to right: J. F. Steffens and R. J. Cargo, Ludlow-Saylor Wire Company; F. A. Olsheski and H. H. Stewart, J. K. Davison & Brothers, Pittsburgh.

Mr. Bird said that the sand-and-gravel industry is dedicated to the defense of the nation, that it stands ready to provide in ample quantity the materials which are so necessary to the construction phases of the defense program. He spoke of the revolutionary forces that are at work in the world and of the necessity of making America fit to withstand the assault of those forces by giving aid to Britain and, if necessary, by taking part in more active ways, however much the American people may hate war.

Joseph H. Dixey, president of the National Ready Mixed Concrete Association, after congratulating the gravel organization on its having arrived at its twenty-fifth birthday anniversary, referred to some of the dangers that beset those ready-mixed-concrete producers who strive earnestly and consistently to conduct their businesses on high ethical standards. He spoke of the industry as "a haven for theorists and technical experts," which has passed far beyond the "trial-and-error stage." The industry will, he said, play a prom-

Left to right: J. F. Meissner, Robins Conveying Belt Company; W. B. Harris, Hendrick Manufacturing Company, Cincinnati; J. W. Meckenstock, Meckum Engineering Company, Chicago; L. F. Hart, Wabash Sand & Gravel Company, Terre Haute.

inent part in the nation's defense program. Its activities are no longer restricted to the areas surrounding, or closest to, central producing plants; many projects now served with ready-mixed concrete are far distant from such facilities. The future of the industry, he said, depends on its reputation for honesty, and the industry can be materially aided in this direction by the development and adoption of sound dealing practices, and in technical ways as well, by the manufacturers of machinery used by the industry.

In his discussion of *The Federal Wage and Hour Law and Its Place in the National Defense Program* Col. Philip B. Fleming, administrator, Wage and Hour Division of the United States Department of Labor, stressed the importance of maintaining the *morâle* of the people at home as well as that of the men at the front. For every one of the latter there are at least ten workers behind the lines whose work and coöperation are necessary to produce the material and equipment he needs. The soldier draws his inspiration "from the kind of civilization" he is called upon to defend. The claim that he is fighting for democracy will be accepted by him if he knows that its principles are being applied in the society which he has pledged himself to protect. The knowledge that everyone is serving the common cause according to his ability, that while he is risking everything no one is being maintained in a sheltered position at home, that his family is not being exploited while another is protected and shielded from every inconvenience, assures him that he is defending principles of equality and democratic sharing of risk and responsibility.

He mentioned the way in which England has spread the burdens and the hazards of the war over all classes without distinction of birth or rank or class. He reminded his listeners that when invasion was clearly threatened, London newspapers were viewing as little short of a scandal the fact that while workers were employed 80 or 90 hours a week in factories 800,000 unemployed persons were living in idleness. As a result working hours were reduced without reducing output; indeed, it was said by Ernest Bevin, Minister of Labor, that production might even be increased. Efficient war effort, the minister said, required the utilization of all available labor and not merely long hours or overtime work for those already employed. Col. Fleming added that employers as well as workers must be prepared to make sacrifices in the defense of the common welfare.

The speaker called attention to the attitude of those who seem to believe that the social gains of recent years are "a sort of meringue of the social pudding," which can lightly be thrust aside as too expensive when a real emergency confronts us. These gains can not be dismissed as "all right for Monday but wrong for Tuesday." We can not say that they are all right as long as nobody objects to them but that they must be thrown down everywhere "the minute anybody finds them standing in the way of anything he wants to do."

Col. Fleming spoke of the general approval of the minimum-wage provisions of the "wage-and-hour" law and of the objection to the 40-hour week. He said that employers who can not attain the desired levels of output by working on the basis of a 40-hour week should work more hours and pay the overtime charge or hire some of the millions of unemployed, which is the objective of the law. To meet the criticism that men of sufficient skill are not available he cited the variety of training programs that are under way to fill the need. In the cases where overtime is unavoidable, the speaker said it is fair, if we ask the worker to sacrifice some of his leisure, to ask the employer to sacrifice some of his profit through higher labor costs. That, the colonel said, "preserves the principle of equality of sacrifice and it is the democratic way of handling the situation." He cited examples to show how the application of the 40-hour week had given employment to many formerly out of work. He referred, also, to cases where the reduction of the number of hours worked per week from 44 to 42 and then to 40 had not reduced the total output but where the same output was produced in five 8-hour days as had formerly been produced in 44 hours.

The speaker said that there might be cases where exceptions should be made, but that such a fact could not be taken as ground for discarding the entire 40-hour week plan. If special industries, or certain localties, require relaxation of the law's demands, adjustments can be made without relaxing them for everybody. He pointed to experiences of World War I when it was found, after increasing the length of the workweek, that none of the state standards of working hours should be relaxed except in special cases certified by the Council of National Defense. Col. Fleming said that Mr. Knudsen, head of the defense commission, had made studies of labor output extending over many years and had come to the conclusion that the 40-hour week is practical. The man who works at a machine 10 hours a day, Mr. Knudsen had found, does only about 8½ hours of actual work. The defense program, according to him, needs more machine hours and not more overtime.

"Let us utilize all our potential manpower," said the colonel, "before we talk about breaking down the standards" of the wage-and-hour law.

Col. Fleming commented also on the seasonal exemption granted by his division to the northern branch of the sand-and-gravel industry and mentioned the fact that some producers had been "unfairly affected" or "discriminated against," as they felt, because of the location of the dividing line. Applications for exemption in a few special cases had been made by producers, and where these were felt to be well-founded they had been granted. This method of obtaining relief is open to all those who think that the division's ruling has imposed hardships on them, he said.

James D. Marshall, assistant managing director, Associated General Contractors of America, Inc., talked about *Construction for Defense*. He referred to construction activity as the first step

in defense. The volume of all construction work for defense purposes he placed at $15,000,000,000, of which $1,500,000,000 could be said to be due to "pure" construction. Two-thirds of the latter amount is under contract. The budget submitted to the Congress includes $620,000,000 for construction and $1,250,000 for other constructional work. Of the $3,000,000,000 total $1,000,000,000 has been undertaken. Because of the emergency nature of the work to be done and the fact that it must be accomplished in less-than-usual time, this $1,000,000,000 is approximately equivalent to from $2,500,000,000 to $3,000,000,000 of normal construction.

This work will not be evenly distributed throughout the country because of the very nature of the defense requirements of the nation. The work will be done where it is needed, whereas W. P. A. projects, by way of contrast, are well distributed throughout the land, being based on unemployment conditions and the need for work. Furthermore, W. P. A. projects are of medium size, while defense projects are larger and are in fewer locations. This difference has created problems in the acquisition of adequate labor supplies.

Mr. Marshall said that the defense-budget estimates might be doubled and that almost every community will feel the demand for some kind of construction. The construction industry, he said, can handle the work given it, if present business methods are not changed. Centralized purchasing may obstruct the successful working out of the program, he believes.

Labor is rapidly adjusting itself to prevailing conditions and to public sentiment, Mr. Marshall asserted. A remarkable spirit of coöperation is being shown by labor on defense projects. The Building Trades Council of the American Federation of Labor and the Associated General Contractors have agreed to meet and discuss labor problems.

There is nothing in the defense budget for defense highways, in spite of the fact that surveys have been made to show where these highways should be built. Some trouble is expected, the speaker said, if the roads near cantonments and munitions plants are not improved.

The trend of world sentiment is toward regimentation, as Mr. Marshall views it, and the construction industry and construction labor are "on the spot" because of delays in defense production. Close mutual understanding of the problems involved in construction work on so large a scale is necessary. If labor should be conscripted, so will its employers. The members of the industry must work closely together, as they will be charged with the responsibility for producing, regardless of who is at fault for delays.

Mr. Marshall does not believe that the construction volume "peak" of $10,600,000,000, reached in 1927, will be attained in 1942 despite $3,000,000,000 worth of defense work.

An increase of about 20 per cent. in the production of sand and gravel and ready-mixed concrete over 1939 took place in 1940, according to Executive Secretary Ahearn's annual and eagerly-awaited report on business conditions in those industries. In 1941 the output of the products of the two industries will show an increase of about 15 per cent. over that of 1940. Both estimates are based on the replies received from a mailing of questionnaires to selected producers.

Price levels reflected increases in production and transportation costs in 1940, due principally to federal and state taxes. Although these factors affected business in every state, their effects were not realized in some sections because of price demoralization, according to Mr. Ahearn. He referred to the overcapacity to produce that exists in both industries as a curse and said that the responsibility can not be placed solely on the theory that there "are" too many people struggling for the same piece of business." In some areas where production reached the highest level on record the average price went to new low levels.

In the ready-mixed-concrete industry the demand for its products utilized about 70 per cent. of its capacity; in the sand-and-gravel industry the demand was about a third of its production capacity. After the demands of the defense program have been satisfied there is danger that the ready-mixed-concrete industry will be seriously and dangerously affected by the reaction of lessened demand.

The chief outlet for sand and gravel, according to the speaker, is highway and street construction. The demand for gravel ballast is active in Ohio, Indiana, Michigan, Illinois, certain parts of Texas, in Utah and Montana. Public-works construction aside from highways, streets, industrial building, and low-cost housing projects, took most of the ready-mixed concrete produced. In 1940 about 80 per cent. of the sand-and-gravel industry's market was in the field of public works, with 90 per cent. of that amount financed by federal money. Defense work is expected to fill the gap produced by the reduction in W.P.A. and P.W.A. activities.

Mr. Ahearn warned his listeners of the dangers of deferring necessary rehabilitation of plants and the purchase of needed equipment and running the risk of finding it impossible, because of voluntary or mandatory priorities, to obtain the required machinery at the proper time. He urged upon them the advisability of anticipating their needs to the fullest extent possible.

The problem of finding adequate car supplies for shipment of the industry's products has arisen in certain sections of the country, but it is to be hoped that the Interstate Commerce Commission will not feel it necessary to exercise its right of issuing priority orders.

Mr. Ahearn mentioned New York State as the principal offender in the diversion of highway funds to other-than-highway uses, the amount diverted in that state having reached $100,000,000 in 1940. Eleven states have adopted constitutional prohibitions against such diversion.

The sand-and-gravel group re-convened Thursday morning for a separate session, the ready-mixed delegates meeting simultaneously in another convention hall in the hotel. Executive secretary Ahearn opened the session with his annual report in which he reviewed

Left to right: Harvey T. Gracely, Marion Steam Shovel Company; Logan Conover and Harry S. Price, Price Brothers Company, Dayton; L. G. Uhl, Marion Steam Shovel Company.

Left to right: R. C. Johnson, Simplicity Engineering Company, Durand, Michigan; L. A. Kuenzli, Kuenzli Quarries Company, Upper Sandusky, Ohio; J. H. Evans, Sturm & Dillard Company, Columbus; F. D. Barber, Simplicity Engineering Company.

briefly the accomplishments of the organization during the past year. He pointed out that some effective results had been obtained in the way of seasonal exemption for operators who had previously not been awarded such exemptions under the wage-and-hour law. Definite progress has been made in obtaining exemption for seamen and further progress along this line is in prospect, Mr. Ahearn indicated, with a definite decision in the matter expected shortly.

The secretary traced developments which have followed in the wake of the rigid enforcement of the Walsh-Healey and Social Security Acts. In connection with social security he urged that when truck drivers are intermittently employed that operators make certain that social security taxes are paid, citing the case of the Grand Rapids Gravel Company in the defense of which the association is preparing to carry on legal proceedings.

During the year the association assisted in drafting a number of effective labor agreements. The Federal-Aid Act is popular with everyone concerned and Mr. Ahearn predicted that generous apportionments under the act will continue unabated in the future. Opposition to the diversion of gasoline-tax and motor-license fees continues to grow and more and more the states are earmarking these funds so that they can not be raided for purposes other than highway construction and maintenance. There is little possibility that a railroad-car shortage will develop during 1941, in Mr. Ahearn's opinion, although future events may change this prediction, he indicated. He also urged that the employment status of men under the draft law be complied with and, where replacements are necessary, the temporary employee should be informed that his work will terminate with the return of the drafted man from military duty. The cost of national defense will be felt on a wide scale by every one and, if war comes, the burden of taxation will, of course, be much greater. Income tax increases will probably strike hardest at the middle income group.

Two talks which were scheduled for this session had to be passed because of the absence of the speakers. John S. Mason of the Dravo Corporation, Pittsburgh, was to have discussed the control of water commerce under the Transportation Act of 1940, but an important meeting of the Maritime Commission at Washington having to do with the very subject of his talk made it impossible for him to attend. The other absent speaker was W. J. McGarry, Association of American Railroads, whose topic was to have been *Car Supply in 1941*.

In a paper entitled *Application of Unemployment Compensation Insurance Statutes to Employees on Dredges,* William E. Hole of the American Aggregates Corporation discussed the technical aspects of the subject and quoted various court decisions which have been rendered. The United States Supreme Court, he said, has declared that dredges are "vessels" and as such are subject to admiralty restrictions irrespective of the nature of work in which they are engaged. Its decision makes no distinction between operating to deepen or widen a channel for navigation as against removing material for commercial use. This, however, has not settled the question. The problem arises from the fact that there is such a great difference in requirements to be met in the various states that all is confusion when the dredges move along rivers forming state boundaries or move from one state to another. Uniform unemployment-compensation laws or the placing of the entire problem in the hands of the Federal government instead of the various states seems to be the only possible solution, said Mr. Hole.

Robert J. Potts of the Potts-Moore Gravel Company, Waco, Texas, spoke briefly on the difficulties encountered in attempting to co-operate with the Works Progress Administration in Texas. His talk was interspersed with a number of humorous anecdotes, which developed from some of the situations encountered.

The session was concluded with the reëlection of officers and directors.

J. R. Thoenen, U. S. Bureau of Mines, presided at the Thursday afternoon sand-and-gravel meeting at which an open forum on the problems of the industry was held.

Stanton Walker, Director of Engineering, first gave a brief *résumé* of the work done by his department during the year. Representation of the association on various technical committees was, as always, an important part of the program. The research laboratory at the University of Maryland, he said, is now in its fourth year and is working out very well. Additional equipment added for freezing and thawing tests, saturating aggregates, etc., has been added, making the laboratory one of the best equipped of its type.

The Stanton Walker Graduate Research Fellowship is also working out very well and research is under way on the effect of certain aggregate characteristics on concrete durability. The possibility of chemical reactions between aggregates and cements and the stripping of bitumen from aggregates are being studied. The laboratory is constantly making tests for member companies and studying the specifications and aggregates in various sections. One of the problems being studied is the chert content, which is causing trouble in certain localities. Studies made in California, said Mr. Walker, showed a chemical reaction between high-alkali cements and aggregates. No such reactions occur when standard Portland cements are used.

The requirement that a minimum of 10 per cent. of sand pass a 50-mesh sieve is becoming quite common, according to the speaker, and some specifications also include minus 100-mesh limits. There is, he said, a trend toward the use of separated sizes of gravel, which requires more accurate gradation and higher screening efficiency. Mr. Walker suggested that the production of asphalt sands be given more attention by producers and that the trend toward aggregate-strength requirements be watched.

According to Mr. Walker some specifications now require that 15 per

cent. of the sand pass a 50-mess screen and 5 per cent. a 100-mesh screen. Soundness and other test requirements are also being made more rigid. Abrasion tests, he said, are now made almost exclusively with the Los Angeles Rattler.

The subject of screening fine sand was brought up by W. L. Smith (Memphis Stone & Gravel Company, Memphis). Irving Warner (Warner Company, Philadelphia) said his company makes no attempt to screen under 4-mesh. Sand classification is done with a sand-settling system of ample area and slow water flow. No trouble is experienced in making a sand with up to 20 per cent. passing through 50-mesh and 4 to 5 per cent. passing through 100-mesh when these fines are present in the raw sand.

Mr. Walker said that not only do specifications for sand limit the percentages of the different sizes but that too wide fluctuation within these limits on any job is not permitted.

Ray V. Warren (Western Pennsylvania Sand & Gravel Association, Pittsburgh) predicted a further trend in specifications toward the regulation of the amount of fines and that more and more work will be affected by such requirements. He also mentioned the grinding down of sand to meet these requirements being done by the Iron City Sand & Gravel Company, Pittsburgh.

A visiting engineer of the War Department said that the types of concrete specified by the army differed from commercial concrete. Cement is taken out of a mix to reduce the heat of hydration and shrinkage in mass concrete and is replaced by an equal amount of extremely fine material. Where this fine material is not in the available sand an inert filler is used. Strength is retained by lowering the water-cement ratio without a loss of workability. He predicted that this practice would be adopted by highway departments. In the Tygart Dam, he said, only 3 sacks of cement was used per cubic yard of concrete. In floodwall construction, however, 5½ to 6 sacks is used.

G. F. Metz (Hardinge Company, York, Pennsylvania) then told about the Iron City Sand & Gravel Company's sand-grinding plant which was described in the September, 1940 issue of PIT AND QUARRY. One of the problems which came up in this connection was to convince the users of the resulting sand that the extreme fines resulting were not silt.

Irving Warner suggested that producers test their waste wash-water to find out how much of the valuable fines is being wasted. Warner Company practice is to take 6-gallon samples and compare with fresh water. The difference gives a basic figure from which the waste is calculated. In its plant less than ½ of 1 per cent. of the extreme fines is being wasted.

E. J. Nunan (Buffalo Slag Company, Buffalo) raised the question of the comparative soundness of crushed and uncrushed gravel. Mr. Walker replied that crushed gravel showed the greater loss and went on to say that soundness tests are also becoming more stringent.

The discussion of gravel-production problems also brought out much interesting information. Mr. Warner described his experience in visiting the Coulee Dam gravel plant recently. The raw material is taken from a deposit which few commercial operators would consider suitable for use. This and other plants supplying Bureau of Reclamation projects have an advantage over commercial plants in that only one specification has to be met. In general, he said, commercial plants compare favorably in efficiency and in the quality of their products.

J. R. Thoenen (United States Bureau of Mines, Washington) gave the preliminary results of vibrating-screen tests being made. A vibrating screen with 2½-, 1½- and ¾-inch openings on its three decks retained 33, 41, and 5½ per cent. of material on these decks, respectively, which should have gone through them. It was found that the less cubical pieces screen most efficiently.

George Renwick (Chicago Gravel Company, Chicago) mentioned the specification of separated sizes of gravel in Indiana and their proposed use in Illinois.

E. E. Mills (American Aggregates Corporation, Massillon, Ohio) said that he found vibrating screens to be best suited for making separated sizes of gravel. This type of material is being supplied from his plant to both the state highway department and governmental agencies.

H. V. Owens (Eastern Rock Products, Utica, New York) said that his company is producing two separated sizes of gravel with one size being a combination of two others. They are now faced with the problem of two sand sizes separated at 14- or 20-mesh for separate delivery to contractors. No trouble is expected in meeting this demand, said Mr. Owen, as it has been the practice for some time to blend several grades to get a combined product.

Mr. Mills said he had used picking belt-conveyors in an effort to remove soft stone and deleterious matter with small success. A soft-stone eliminator was then installed and specifications were easily met. The breakage caused by this type of crusher, he said, made acceptable fines for sand.

E. K. Davison (J. K. Davison & Brothers, Pittsburgh) said his company used an impact pulverizer with some success. For paving round gravel is added to the crushed with good results. All the gravel over 3 inches in size is discarded because of the presence of soft stone in the larger sizes, and 2- to 3-inch gravel is crushed to 1½-inch minus. The use of the eliminator also tended to break up flat pieces into more cubical shapes.

C. A. Bickel (Iron City Sand & Gravel Company, Pittsburgh) said that the crushing of the large gravel made the Los Angeles Rattler test results worse.

With respect to the rattler tests Mr. Warren said that one test should never be considered conclusive as one large

Left to right: L. E. Lumpkin and J. M. Dowdy, Marquette Cement Manufacturing Company; R. S. Hunt, Screen Equipment Company; W. J. Steiner, Steiner Washed Sand & Gravel Company, Laura, Ohio.

Left to right: O. S. Conrades, St. Louis Material & Supply Company; H. F. Thomson, General Material Company; Michael Hendy, Mississippi River Sand & Material Company; A. C. Butterworth, General Material Company; George Herbst, Jr., Mississippi River Sand & Material Company, all of St. Louis.

piece of defective gravel in a sample could cause a difference of 2 or 3 per cent. in the test results. He advised taking the average of at least three tests before rejecting a material.

C. W. Purdy (Killbuck Sand & Gravel Company, Killbuck, Ohio) said that experience showed that the speed of an impact-type soft-stone eliminator must be adjusted to various types of material. J. R. Thoenen advised against attempting to hand-pick any material under 1 inch in size.

According to Stanton Walker, the ratio of the amount of water a stone will absorb to its pore space is important to the result of a soundness test.

He opened the discussion of stock-piling and handling methods to avoid segregation by saying that producing and storing separated sizes does not always eliminate segregation in stock-piling, although it is helpful.

Mr. Purdy said his company's practice follows those specified by the state. Stock-piles are built up and reclaimed in layers by a crane.

Mr. Renwick described the use of a shuttle belt-conveyor for stock-piling with no provision against segregation. In picking up the material with a crane it is reblended by taking each bucketful from a different part of the pile. Car-loading spouts are designed to prevent segragation in loading.

Irving Warner (Warner Company, Philadelphia) prefers the stock-piling of strip sizes and reblending them on a reclaiming belt-conveyor. This system is a disadvantage only when a large top size is required which involves the blending of 4 or 5 strip sizes. He advised, for materials used only in small proportions in blends, the use of a small gate for this purpose and a larger gate to be used when loading out this material alone. He also said that the same screen should not be used for sizing very large and very fine materials.

C. F. Mullen (Florida Gravel Company, Chattahoochee, Florida) described his experience in having moisture determinations of sand made at the point of delivery and having the moisture weight taken from the bill.

Mr. Warren said that in the Pittsburgh area many users are asking for allowances for excess moisture. As an example, 34,000 tons of sand delivered for use on the Pennsylvania Turnpike contained 3,000 tons of water at $2.00 per ton. He also said that new concrete designs take moisture content into account. He advised producers to protect themselves by stating in their quotations that the moisture content is kept at the lowest possible level.

J. V. Owens (Eastern Rock Products, Inc., Utica, New York) said his company's employees have learned to estimate visually the water content accurately enough for practical purposes. As much as 10 tons of water has been found in a 50-ton car of sand.

This interesting meeting closed with a request by Stanton Walker that members write in their requests for subjects to be discussed at the next convention.

The Friday morning session was presided over by Robert J. Potts (Potts-Moore Gravel Company, Waco, Texas), who opened the meeting by telling what Texas is doing to put its roads in shape for the defense effort.

The first speaker was Perry A. Fellows, chief engineer, Work Projects Administration, Federal Works Agency. His subject was *The W.P.A. Program and its Significance to the Sand-and-Gravel and Ready-Mixed-Concrete Industries*. He first presented information on the amounts of aggregates, cement and other materials used in this program. The primary objective of this body, said Mr. Fellows, is to provide work for the needy unemployed on useful public works, providing the greatest possible amount of work for the amount of money spent. In this process, he said, the workers' self-respect is saved.

Mr. Fellows insisted that the production of aggregates by the W.P.A. for use on its propects competed only to a slight extent with private industry. As much material is purchased as is possible within the limitations governing the expenditure of funds. The W.P.A., he said, produces its own material usually only when the community is unable to pay its share of the cost of a project using purchased materials. The limit imposed is a maximum of $6.00 per man per month for materials and the purchase or rental of equipment or less than 20 per cent. of the money spent. Now, he said, these non-labor barriers can be exceeded if the job is certified as a defense project. This type of work is being paid for out of a special $25,000,000 appropriation.

According to Mr. Fellows, the W.P.A. follows the common construction practice of letting the sponsor of a project pay for the materials if possible. The sponsors maintain the projects after their completion and buy the materials used for this purpose. Even when materials can not be bought outright available production facilities are used if possible. In 1940, he said, the Ohio W.P.A. bought much more material than it produced. Ready-mixed concrete in particular was widely purchased for use in sidewalks.

In closing, Mr. Fellows mentioned the fact that over 70,000 miles of access roads have already been exempted from the W.P.A. requirements. Work on these access roads is considered to be of even more importance to immediate defense needs than the main arterial highways. He estimated that in the year beginning in July, 1941 more than 1,300,000 men would be employed by the W.P.A.

Mr. Potts made the comment that the humanitarian angle of the W.P.A. is its justification. He also said that while the W.P.A. did help to improve business conditions other factors were even more important.

Thomas H. MacDonald, Commis-

sioner of Public Roads, Federal Works Agency, was not present to give his paper on *Federal Highway Policy as a Part of the National Defense Program*. This paper, it was announced, was similar to the one delivered by Mr. MacDonald at the recent National Asphalt Conference at Dallas, Texas. An abstract of this address was published in the January, 1941 issue of PIT AND QUARRY, page 86.

Hal G. Sours, director, Department of Highways, State of Ohio, who was supposed to have introduced Mr. MacDonald, spoke on the same subject. In laying out a highway program for defense we must first appraise the existing assets and then determine what is needed for military and civilian needs combined. As an example Mr. Sours pointed out the importance of highways to the German military machine and said they well illustrated our need. The military and commercial needs for highways arise in the same areas because industrial sections are always the first to be attacked.

The Public Roads Administration, said Mr. Sours, has made a series of surveys showing highway needs as a guide for local governments. The federal-aid highway program for 1941 will be concentrated largely on defense highways. One of the most pressing problems, according to Mr. Sours, is the improvement of highways in and around large cities.

In pointing out the Pennsylvania Turnpike as an example of modern highway construction Mr. Sours said that even in the month of December the income paid all the charges and that it was undoubtedly a paying investment. He believes that toll roads may be the best way to obtain funds for expensive highways of this type, as few states can afford to devote such a large part of their expenditures to construction in a limited area. He mentioned bridge and shoulder widening as a major requirement for the military roads. In general, he said, roads which are of military importance only should be paid for by the government.

The labor-relations session, introduced as a feature of the association's conventions several years ago, marked the high-spot of interest for many of those who attended this convention. Although the identity of the many persons who participated in the discussions can not be revealed for fear of checking the freedom and spontaneity of their future remarks, it is possible, without violating confidence, to refer briefly to some of the comments made.

In his brief discussion of federal laws affecting labor relations Executive Secretary Ahearn referred to the so-called "stock-pile rule" as applied to the Walsh-Healey law. This provides that where orders are filled from stock-piles, only the labor utilized in removing the material from the piles comes under the wage-and-hour provisions of the law. The drivers of trucks owned by the producer are under those provisions until delivery to the government has been completed, but where the trucks or other carrier vehicles are owned by others, the producer's obligation to conform to the law ceases when loading of the vehicles has been completed.

An *ex tempore* symposium of reports regarding wages, hours and working conditions now in effect brought out some interesting facts. In Chicago common labor is receiving 55 cents an hour under a contract which expires with December 1 of this year, semi-skilled labor receives from 60 to 65 cents, and skilled labor 85 cents. A request for higher rates has been made: for an increase of 5 cents an hour beginning February 1 and for an additional 5 cents an hour beginning September 1. Locomotive engineers receive $1.20 an hour and crane operators $1.30.

In Boston highly-skilled labor is paid $1.25 an hour.

In Philadelphia common labor is paid 63 cents an hour, semi-skilled labor 65 cents, and skilled labor from 80 cents to $1.00.

In St. Paul the scale for common labor is 55 cents an hour, and for skilled labor, such as crane operators, $1.10. In the ready-mixed-concrete industry common labor receives 62½ cents and skilled labor (drivers) 85 cents.

In Cleveland 70 cents an hour is paid to common labor, 90 cents to truck drivers and 80 cents to others working a 44-hour week; crane operators receive $1.25 on the basis of a 48-hour week.

In Pittsburgh the rate for common labor is 58 cents an hour, that for semi-skilled 62½ cents an hour, and that for skilled workers 97 cents. Truck drivers are paid 75 cents an hour and hoisting engineers $1.30.

In New York city 75 cents an hour would be paid to common laborers, 85 cents to $1.00 to semi-skilled labor, and $1.50 to skilled workers under a scale that has been proposed.

In Kansas City common labor receives 60 cents an hour; drivers of flat-bed trucks receive 65 cents and drivers of ready-mixed-concrete trucks receive 85 cents an hour.

In the state of Florida, not under union agreement, common labor gets 40 cents an hour. Union truck drivers get 60 cents, and crane operators $1.25 (with a weekly guarantee of at least $40.00).

In southern California, under contracts expired December 1, 1940, common laborers received 60 cents an hour, drivers of 4-wheeled trucks 80 cents, drivers of 6-wheeled trucks 85 cents, and drivers of truck-trailer combinations 90 cents. On March 1 these rates will rise 5 cents an hour.

In Buffalo common labor is paid 65 cents an hour, truck drivers 70 to 75 cents, ready-mixed-concrete truck drivers 85 cents, and engineers (union) $1.25.

In St. Louis in the sand-and-gravel industry common labor earns 65 cents an hour, firemen and oilers 80 cents, and engineers $1.10. In the ready-mixed-concrete industry the common-labor rate is $1.00, that of truck drivers 90 cents, that of skilled labor from $1.50 to $2.00.

There is tendency toward the fixing

Left to right: G. W. Renwick and G. E. Singletary, Chicago Gravel Company, Chicago; C. D. Gray, Ready Mixed Concrete Company, Indianapolis; F. M. Welch, F. M. Welch Engineering Company.

P. S. Klyne, West Jefferson Sand & Gravel Company, West Jefferson, Ohio; A. Goldberg, Allis-Chalmers Manufacturing Co.

of minimum numbers of hours of work. Thus in Philadelphia it is provided that every man who is put to work on the first day of any week must be paid for at least two-thirds of the union workweek of 48 hours, or 32 hours. He can be transferred to other work to fill those 32 hours, if the new work is "not objectionable."

Daily limitations on the number of hours that may be worked are rather common. In Kansas City the daily limit is 9 hours, the weekly limit that of the federal wage-and-hour law. In Philadelphia there is no daily limit except for marine workers, for whom the limit is 12; but there is a weekly limit of 40 (previously 48) hours for others and limits of 66 and 72 hours for marine workers. In Boston there is a daily limit of 8 hours for drivers (between 7 a.m. and 5 p.m.) and engineers, and a weekly limit of 44 hours. In Pittsburgh there is no daily limit except for hoisting engineers, whose day is restricted to 8 hours, but there is a weekly limit of 48 hours. In St. Paul the length of the truck driver's day is not limited but his week is restricted to 48 hours. In Chicago common labor has a daily limit of 10 hours and engineers one of 8 hours; neither has a weekly limit. In New York city the daily limit is 8 hours but this may be extended to 9 if the worker consents. In St. Louis laborers and engineers are limited to 8 hours and truck drivers to 9 hours a day, with double-time overtime compensation for the former and time-and-one-half for the latter. In southern California the daily limit is 10 hours with time-and-one-half thereafter. In Buffalo there is only a weekly limit of 40 hours after which time-and-one-half must be paid.

Vacations with pay are becoming more common. In Philadelphia one contract provides 2 weeks for licensed men, 7 days for barge captains, and 10 days for others. In Pittsburgh one week has been agreed upon. In Boston the workers on boats receive one week's vacation with pay. In New York city one producer operates his boats with three crews, only two of which can be housed aboard, the third crew being kept idle on shore at full pay. In Buffalo one agreement provides for a week's vacation. The other cities mentioned before appear to be without any agreements providing vacations with pay.

The Warner Company, sand-and-gravel and ready-mixed-concrete producer, Philadelphia, was awarded a trophy for the completion of more than 100,000 man-hours of labor without a single lost-time accident.

On Tuesday, the day preceding the opening of the convention, the board of directors of the National Sand & Gravel Association held its regular annual meeting. It was decided to schedule the board's next semi-annual meeting for Washington, D. C., where it has been held late in September or early in October in the last two years.

Executive Secretary Ahearn called attention to the fact that barge captains have been called "seamen" within the meaning of the Fair Labor Standards Act by the Circuit Court, in contradiction of Interpretative Bulletin II of the Wage and Hour Division of the United States Department of Labor which held that they are not. The Wage and Hour Division has called off field enforcement of the law's provisions against workers employed on dredges operating on navigable streams. Where the men live on board the dredge they are considered seamen. Those workers who go aboard in the morning and leave at night are probably not seamen.

The Bureau of Internal Revenue has ruled, on the basis of an unpublished opinion by its chief counsel, that producers who hire trucks which are driven by their owners stand in the position of employer with respect to such truck owner-operators, who are considered employees within the meaning of the Social Security Act. As this law was enacted in 1936 the potential danger of a decision making the applicability of the law in such cases retroactive to that date may be very great. The situation with respect to those producers who rent trucks from companies or individuals who do not themselves operate their trucks may be the same. Producers who rent their haulage equipment from others would be well-advised to inquire whether the owners of the trucks rented—either individuals or corporations—have paid, or are paying, the social-security tax on their employees.

Left to right: F. P. Blancett, Diamond Iron Works; R. S. Spencer, Spencer Equipment Company, Massillon, Ohio; W. P. McCarren, W. P. McCarren, Walhonding, Ohio.

B. F. France and M. McGinniss, Portsmouth Sand & Gravel Company, Portsmouth, Ohio; H. L. White, Eagle Iron Works.

The board reëlected the 1940 executive committee, whose members (other than officers) are Anderson Dana (New York), Robert Mitchell (Los Angeles), George W. Renwick (Chicago), and John M. Settle (Louisville, Kentucky). It also nominated the 1940 officers for 1941: Paul P. Bird (Boston) for president; Otto S. Conrades (St. Louis) for vice-president; and H. S. Davison (Pittsburgh) for secretary-treasurer. The board reëlected for 1941 the following board members-at-large: Otto S. Conrades (St. Louis), Floyd C. Fuller (Portsmouth, Ohio), J. P. Eyre Price (Scranton, Pennsylvania), Stephen Stepanian (Columbus), and E. Guy Sutton (Mattoon, Illinois).

At the annual dinner on Thursday evening the management of the Netherland Plaza presented the association with a twenty-fifth anniversary cake, which appropriately was cut by Ruth Renwick, daughter of Frank W. Renwick, the first president of the association twenty-five years ago.

Speaking at the Manufacturers' Division lunch on the same day Executive Secretary Ahearn drew attention to the fact that this was the first time that the morning of the convention's open-

(Continued on page 50)

By FRED B. FRANKS
Vice-President and General Manager
National Portland Cement Company

Raw-Material Flotation Systems Allows Production of Many Types of Cements

IN anticipation of more rigid cement specifications, particularly those of the five new A.S.T.M. types, the National Portland Cement Company placed its new minerals-separation plant in regular operation on May 20, 1940. The preparation of kiln-feed compositions to satisfy the requirements of the several specifications, is accomplished under unusual flexibility in control. The actual corrections of the raw mixtures are made both by centrifugal sedimentation and froth flotation, the first commercial application of this improvement of the Breerwood process.

Although the principal reason for adopting the process was to facilitate the production, at will, of cements of all types from raw materials available in the quarry, the decision to use it was influenced by several other considerations. These included the ability to use straight-ahead quarry operations, as distinguished from selective quarrying, and to avoid working to an uneconomical depth. Further, that only about half of the average run of the quarry would have to be treated to provide the necessary corrections for the production of improved commercial cements, and that at least two products of increased lime content could be obtained, which could be blended in various proportions with untreated slurry for the manufacture of any Portland cement. It had also been determined that high degrees of correction could be obtained without grinding the raw material any finer than had been the previous practice in the preparation of kiln feed, namely from 90 to 92 per cent. minus 200-mesh.

The process plant was designed by the Separation Process Company in cooperation with F. L. Smidth & Company, acting as consulting engineers in behalf of the National Portland Cement Company. It involves the first commercial use of several new methods of minerals separation and cement raw-material beneficiation. These include, in addition to the first use of a centrifuge for making an actual composition correction, the first flotation concentration and removal of graphitic carbon prior to the concentration of the lime, and the first successful flotation concentration of any mineral from a raw material of such extreme fineness that it may properly be termed a "slime," the fineness of the flotation-cell feed being practically all minus 15 microns (equivalent theoretically to all minus 1,000 mesh) the feed containing a large proportion of colloidal matter.

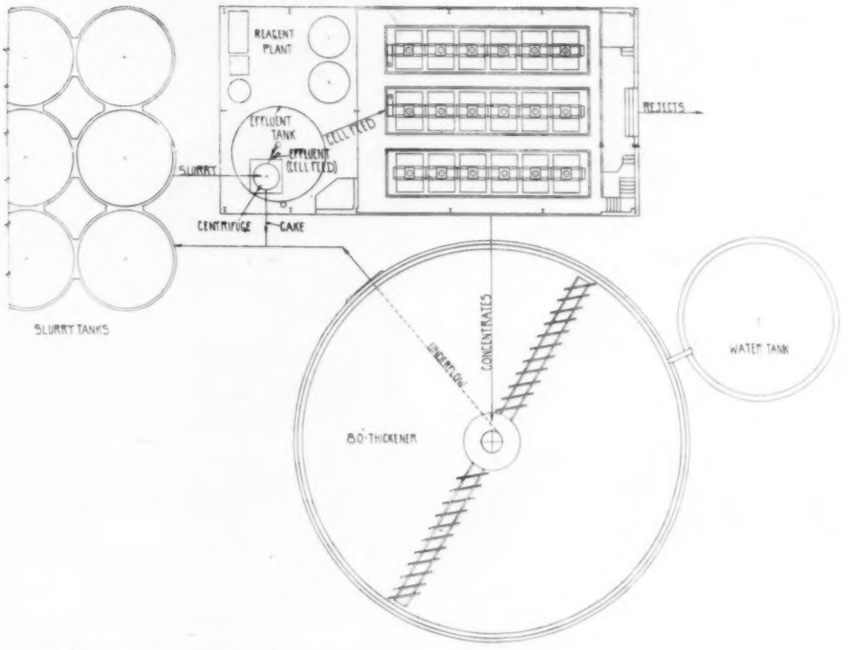
General view of the process plant. The six storage and blending silos are shown in the background, concentrates thickener at left, water-storage tank at right.

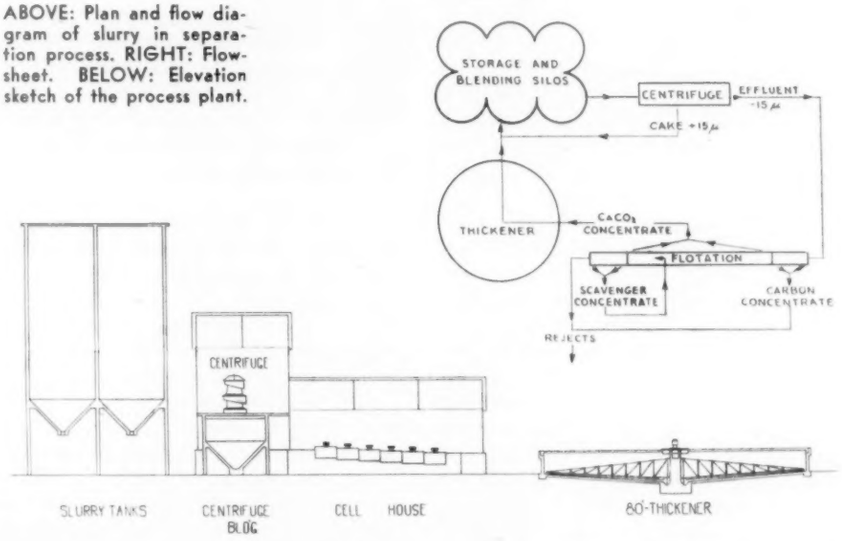
The general method of processing is in sharp contrast to that in use in other mills using the Breerwood process. In both methods the tube-mill slurry is classified to separate a "fine" and a "coarse" fraction. The usual procedure is to make the principal corrections by subjecting the coarse fraction to flotation. Here, the principal correction. *i. e.* the concentration of the lime, is made by subjecting the fine fractions to flotation, and at a fineness far beyond anything believed possible by flotation chemists. Under average conditions only about half of the raw materials, in the form of tube-mill slurry, is sent to the processing plant, where the centrifuge classifies the material into a fine and a coarse fraction of about equal parts by weight. The operation of the

Interior of the cell-house, showing three rows of flotation machines.

centrifuge is controlled so that the undesirable proportion of clay minerals is concentrated in the finer fraction, or "effluent," of the centrifuge. This raises the lime content in the coarser fraction, or "cake," to approximately ordinary composition. The finer fraction, which has been lowered in grade, and which comprises about one-quarter of the total weight of the original slurry, is subjected to flotation to raise the lime high enough so that compositions can be prepared by blending for any of the types. Ordinarily, in the manufacture of commercial cements the mixture is prepared simply by recombining the flotation concentrate, the centrifuge cake or "coarse" fractions with the untreated half of the original slurry.

The development of the present design of the process plant was started even before the cement mill itself was built. The preliminary investigation of the rock deposit, made before construction was started by Richard K. Meade & Company, Inc., revealed that raw materials were available on the property for the manufacture of at least 100,000,000 barrels of high-early-strength Portland cement. It seemed evident, however, that there would be a definite trend toward much more rigid cement specifications than those in force at that time. A large number of specimens, obtained during these investigations, were therefore sent to the Separation Process Company to determine whether or not the various types and grades of rock would respond satisfactorily to froth flotation. The cement mill was, accordingly, designed so that a processing plant could be installed at a later date with the minimum disturbance and without interfering either with normal plant expansion or the flexibility of its advanced method of wet-process correction, which has since attracted much favorable comment. The plant and quarry were fully described in the May, 1935 issue of PIT AND QUARRY, and the present description is limited to the processing plant itself, and the departments directly affected by the process.





ABOVE: Plan and flow diagram of slurry in separation process. RIGHT: Flowsheet. BELOW: Elevation sketch of the process plant.

The vertical centrifuge. Dilution tank and check box are on platform at upper right.

The deposit includes two distinct formations, Beekmanstown and Lower Jacksonburg limestones, both of which could be worked from the same quarry, the present working being in the Jacksonburg limestone. The Jacksonburg limestone itself comprises two general types having distinct lithologic characteristics. The first type, which occurs most typically in the southwest corner of the quarry, is a dense, very fine grained rock, *i. e.* the crystallization is much finer than the more usual rock of this formation in the Lehigh Valley. It has a conchoidal fracture, and contains somewhat more carbonaceous matter than the second type, the carbon being colloidal and highly dispersed. The second type is less hard, tending to break in slabs and blocks, and is not quite as fine-grained as the first type. It is higher in lime content and contains less carbonaceous matter. It is well exposed on the north side of the quarry at the foot of the plane.

Petrographic study revealed that the chief mineral components are calcite, a small amount of dolomite, quartz in the form of chert, muscovite mica chiefly in the form of sericite, pyrite and carbon. Some recrystallized calcite grains up to one-half millimeter are present in most specimens, but mica and quartz crystals are under 20 microns in nearly all cases, except for some veins of larger quartz crystals.

After crushing to 1-inch size and under, the rock is ground to 90 to 92 per cent. minus the 200-mesh sieve in open circuit at the rate of 1,300 to 1,400 tons a day in two F. L. Smidth 8- by 36-foot 4-compartment Unidan mills driven by 800-horsepower Westinghouse motors

through Symetro speed-reducers. The slurry is pumped by one of two Wilfley pumps to one compartment of a distribution tank above the slurry storage and blending tanks. From the distribution tank the slurry may be discharged into any one of six concrete tanks provided with conical bottoms, the tanks being 22 feet in diameter and having an effective slurry level of 35 feet. Agitation is maintained by air admitted at the bottoms of the silos from two Fuller two-stage rotary compressors, which also serve a Fluxo cement-conveying system.

In the original wet-process blending arrangements slurry could be discharged by gravity to a sump and pumped to a second compartment of the distribution tank, likewise having six outlets to the silos. A blend of the contents of two or more silos can be pumped either into another silo or directly to the kiln-feed tanks, but normally the blended slurry flows by gravity to a slurry basin in the kiln building, in which agitation is maintained by an F. L. Smidth traveling mechanical and compressed-air agitator. The flexibility of this method was not disturbed by the installation of the process plant, which supplements the controls just described.

The present normal method of preparing and controlling kiln-feed composition can best be explained by taking, as an example, the manufacture of a regular commercial cement, and this will explain the usual operation of the process plant. Assuming, for convenience, a daily production of 4,000 barrels of clinker, which is somewhat below average, and the use of Jacksonburg limestone of 73 per cent. $CaCO_3$, the rock quarried and ground, at the rate of 1,300 tons a day, is pumped to storage from which one-half of the tonnage is continuously withdrawn and pumped to the process plant, where the centrifuge again divides the slurry into about equal parts by weight. The centrifuge

The reagent-preparation department. The crude products from which the reagent is made are received in drums which are heated in the tank at the left in the background.

is so operated that the cut or split is made in the range of particle size at about 15 microns. A remarkably sharp separation, according to particle size, is made and the objectionable proportion of fine clay minerals is concentrated in the fine fractions, or centrifuge effluent.

The coarser fractions or centrifuge "cake," *i. e.* the particle sizes plus 15 microns are increased in $CaCO_3$ content to slightly above 75 per cent. by the action of the centrifuge in concentrating the free clay minerals in the finer fractions. The centrifuge cake is, accordingly, pumped to the blending silos as the first recovered product of the process plant.

The finer fractions, or centrifuge effluent, have been reduced in $CaCO_3$ content to about 71 per cent. These fine fractions, representing only about a quarter of the tube-mill slurry, are subjected to flotation to produce a concentrate of about 85 per cent. $CaCO_3$. These concentrates are the second of the two recovered products of the process plant and are likewise pumped to the blending silos, the kiln feed being prepared by mixing them with the centrifuge cake and unprocessed slurry. As the analyses given in the table will show, these three materials can be blended in various proportions to produce compositions suitable for the production of the various cement types. Although the centrifuge "cake" has been referred to as the "coarse fraction," this product is actually of excellent kiln-feed fineness and this, together with the reasons for processing the materials in this manner, will be explained in the description of the process plant and its equipment.

The detailed results of a typical day's operations, December 18, 1940, are expressed in terms of relative quantities and $CaCO_3$ grades, at the principal points of change in processing, and are based upon the production of kiln feed in the equivalent of 4,100 barrels of clinker a day, in Table I.

TABLE I.—TONS PER DAY OF PRINCIPAL PRODUCTS

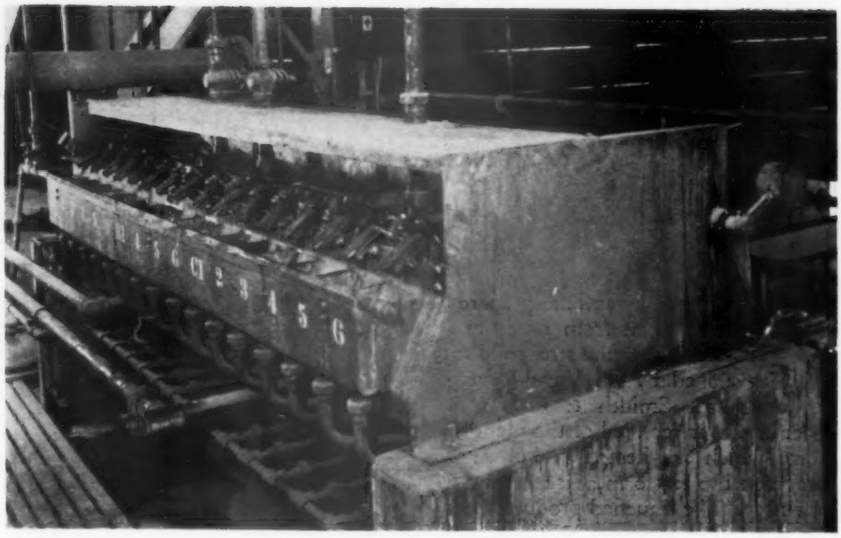
Product	Tons Dry Weight	Per cent. of Original Weight	Per cent. of $CaCO_3$
Tube-Mill Slurry	1,330	100.0	72.7
Unprocessed Slurry	678	51.0	72.7
Centrifuge Feed	652	49.0	72.7
Centrifuge Cake	287	20.6	74.7
Centrifuge Effluent (Flotation Feed)	365	28.4	71.26
Concentrates	276	.....	85.02
Rejects	89	.....	28.91
Cake + Concentrates	563	.....	79.96
Cake + Concentrate + Unprocessed Slurry	1,241	.....	76.0

Note the color contrast between the jet-black carbon concentrates and the lime concentrates in this view taken from the feed ends of the cells.

The complete analyses of the tube-mill slurry, the various products and a kiln feed representing the direct remixture of the unprocessed slurry, the centrifuge cake and the flotation concentrates are shown in the Table II.

TABLE II.—ANALYSES OF PRINCIPAL PRODUCTS

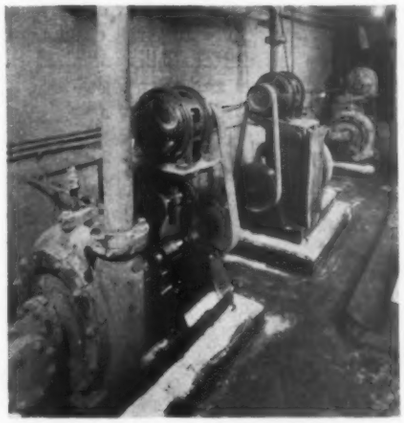
Product	Mill Slurry	Centrifuge		Concentrate	Concentrate + Cake	Concentrate + Cake + Mill Slurry	Rejects
		Cake	Effluent				
SiO_2	16.94	16.19	17.48	7.87	11.94	14.67	47.10
Al_2O_3	3.22	2.26	3.92	1.92	2.09	2.71	10.08
Fe_2O_3	1.20	1.14	1.24	0.62	0.90	1.07	2.98
$CaCO_3$	72.70	74.70	71.26	85.02	79.96	76.00	28.91
CaO	40.71	41.83	39.91	47.61	44.78	42.56	.....
MgO	2.70	3.20	2.34	2.06	2.62	2.66	.....



The multiple reagent feeder. The feed cups are numbered to correspond to the numbered cells in the flotation circuit.

From the complete analyses of the various products, and particularly that of the concentrates and cake, it will be seen that blending in proper proportions will provide for the essential corrections to produce any one of the five A.S.T.M. types or other modern cements.

That proportion of the tube-mill slurry which is to be processed, usually about one half of the total, is substantially continuously discharged from storage into a concrete pump-sump through a motor-driven Fuller slurry valve, the valve motor being controlled by a float and opening and closing about every two minutes. A Wilfley pump conveys the slurry to a feed-tank above the centrifuge, the excess being returned by gravity to the sump. The slurry is diluted and flows by gravity at a uniform rate to an F. L. Smidth & Company vertical centrifuge driven by a 40-horsepower direct-current Westinghouse motor, the actual power consumption being 25 horsepower for the operating conditions and capacity described.



Three pumps which handle the tailings of the flotation circuit.

Because, in a normally ground slurry of these finely-crystallized materials, the mineral bonds are broken, *i. e.* the mineral constituents are free, only in the sizes finer than about 20 microns, and because the clay or micaceous minerals are concentrated in the low orders of particle size, the centrifuge is controlled to classify or split the material at about 15 microns, by adjusting its speed with relation to the dilution and other means. The coarse fraction, or cake, is considerably improved in chemical composition. For this reason, and because there are substantially no free mineral constituents, other than calcite, in the fractions plus 20 microns, there is no object in classifying at a higher point in the particle-size range to increase the relative proportion of the fine fraction to be further corrected by flotation or in regrinding or resorting to finer original grinding to free the mineral bonds. The unbroken, or composite, rock particles obviously retain their constituent minerals in perfect contact for burning. Thus, the centrifuge provides one product that can be used as a component of the kiln-feed mixture and a second product especially satisfactory for flotation separation because the mineral particles are physically released, although of extreme fineness. The abundance of colloidal matter and particles of colloidal behavior, together with the wide dispersion of colloidal "graphitic" carbon, both of which were supposed to make successful flotation concentrations impossible, should make these operations especially interesting to flotation chemists.

The centrifuge effluent is discharged by gravity into an agitated storage tank, provided with a conical bottom, from which a Millville centrifugal pump elevates the slurry to a constant-level tank overflowing by gravity to the storage tank. From the constant-level tank the material flows by gravity under control of a Masco-Grigsby rubber pinch valve to the cell room.

The flotation-cell room includes three parallel rows of the American Cyanamid Company's modified 66-inch Fagergren flotation machines driven by 7½-horsepower vertical Crocker-Wheeler motors, consuming about 5 horsepower, the cells of each row being connected in series, *i. e.* the tailing of one cell being the feed to the next. The centrifuge effluent, or cell feed, flowing by gravity at the rate of about 325 to 375 tons a day, enters the first cell of the central row. The first three cells of this row are used to remove a jet-black carbon concentrate, principally to improve the separation of the lime in the remainder of the circuit, the separations being made by additions of small quantities of a resinate, kerosene, and du Pont B-23 alcohol frother.

The three remaining cells of this row, all the cells of the south row and the first three cells of the north row are used to make a "roughing" concentration of the lime, to produce a concentrate of about 85 per cent. $CaCO_3$. The last three cells of the north row are used as "scavengers" to recover the free-lime (calcite) particles, and because the grade of scavenger concentrates is relatively low, they are pumped in closed circuit to the first cell of the row for cleaning, with the flotation of the tailings from the south row. The rejects or tailings of the last cell of the north row are the rejects of the plant. The cell underflow of each row is handled by a separate Millville slurry pump.

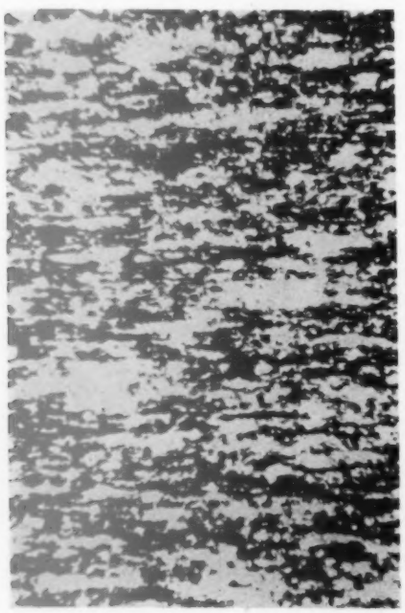
The concentrates flow into a common sump from which a Millville pump transports them to an 80-foot Dorr Company, Inc., torque-type thickener, driven at the rate of one revolution in 46 minutes by a 1-horsepower Louis Allis motor. The overflow water from the thickener flows by gravity to an adjacent water-storage tank, where adequate supply is maintained by a

Pump room located below the concentrates thickener.

float valve controlling make-up water pumped from the quarry. The thickened concentrates, *i. e.* the underflow of the thickener, together with the centrifuge cake flow by gravity to a concrete sump in which the proper head is maintained by float-control of a motor-driven Fuller slurry valve. A Wilfley pump transports the slurry from the sump to the blending silos.

Three Worthington Monobloc pumps are used respectively to supply feed-water to the constant-head water-supply tank above the centrifuge, the water sprays in the cell house and the water sprays on the bridge of the thickener, which serve to break down the froth, these pumps being cross-connected so that one pump can satisfy any one of the three requirements.

The successful flotation of the calcite, from a feed of such extraordinary fineness, is attributable to the use of very small quantities and the careful selection of the several flotation agents and reagents, the method of adding them to the pulp, particularly the addition of the principal reagents in small increments to each of the cells of the flotation circuit. Du Pont B-23 alcohol frother, kerosene and a dilute resinate are fed only to the cells used for concentrating the carbonaceous matter, these reagents being used in exceedingly small quantities. In addition to collecting the carbon, the residue of alcohol and resinate remaining in the water of the pulp maintain frothing in the balance of the circuit. Dilute Goulac is used to disperse natural flocculation and also to depress the residue of carbon in the lime flotation circuit. It is fed to the first cell of this circuit, *i. e.* the fourth cell in the central row. The principal reagents which collect and concentrate the calcite are oleic acid, and the Separation Process Company's "B-K" reagent. Both these reagents are fed in very small increments to each cell in the lime concentrating circuit. The B-K reagent is especially interesting, as it can readily be controlled and dispersed rapidly by feeding it as a dilute solution.



Photomicrograph of a thin section of dense type of Jacksonburg limestone from the quarry showing the extreme elongation (schistosity).

With the exception of the oleic acid and kerosene, the reagents are prepared in the flotation plant from crude and raw materials. The crude semi-solid reagent, developed by M. Vogel-Jorgensen, of F. L. Smidth & Company, Copenhagen, is received at the plant in drums which are heated in hot-water storage on the platform adjacent to the centrifuge. The liquefied products flow into a reaction tank where controlled quantities of chemicals are added with water, the mixture being heated with steam to complete the reaction. The reaction products readily ionize in water to release surface-active ions having excellent collecting capacity for oxide minerals such as calcite, the reagent having collecting capacity equivalent to oleic acid, but having the advantage of being water-soluble and readily diluted for rapid dispersion in the cold water of the flotation circuit. From the reaction tank the prepared reagent is sent to either of two insulated, steam-heated storage tanks, where it is diluted.

The resinate and the Goulac are received in the form of dry powder and are separately diluted, the latter being fed at a uniform rate by an F. L. Smidth needle-valve feeder. The oleic acid and kerosene are fed directly to the cells by Clarkson feeders.

The B-K reagent and the resinate, both in dilute form, are fed by an F. L. Smidth & Company multiple feeder of a novel type. This feeder comprises a separate tank for the two reagents, which are maintained at a constant level. Above each compartment, feed cups, in number corresponding to the number of flotation cells, are secured to a horizontal shaft. Limited partial rotation of the shaft alternately dips the cups into the reagent and causes them to discharge into small feed spouts serving separate pipe-lines leading to the individual flotation cells. The angular position of each cup is adjustable on the shaft during operation to control the actual quantity of reagents discharged to suit the requirements of the individual cells.

Volunteer Increases Storage Capacity

The Volunteer Portland Cement Company has placed in service 11 new storage silos at its plant at Knoxville, Tennessee. The silos have a capacity for 65,000 barrels of finished cement, increasing former capacity by 70 per cent.

The Volunteer plant is currently operating on a 24-hour-a-day schedule and is looking forward to near-capacity operation throughout the year. The company is supplying about half the cement requirements for Cherokee Dam.

Employee Relations

By B. F. HEDRICK
Hedrick Gravel & Sand Company,
Lilesville, North Carolina

For several years we have been making a close study of the relationship between the employer and the employee. We have found in making this study that the employer must know the individual needs of each of his employees to understand their personal problems better.

Each Christmas we order several truck-loads of hams, bacon, flour, fruits, candy and cakes and see that each employee has enough food for his entire family during the Christmas holidays. Once or twice during the year we buy sheets and pillow cases and blankets and divide them among our employees. They appreciate this because no one ever has too much bed linen and cover. Employees' families also receive fruit and candy from the company at numerous occasions.

We have a hospital in Salisbury to which any of our employees may go and the operations are free of charge. We pay their doctors' bills for all their minor sicknesses and then let them pay us when they are financially able.

The majority of our employees have automobiles. We pay for each automobile and then let the owner pay us in small payments each payday as he is able. Also, in any financial difficulties which our workers may have, we help them out with loans and let them pay us back when they can without interest.

In order to know each employee and his family socially we have a barbecue every two weeks. Each employee receives a personal invitation to come and bring his entire family and stay as long as he likes. We raise the hogs on our farm in Rowan County and have four or five killed every two weeks for these barbecues.

Last summer we built a barbecue pit and outdoor fireplace on the banks of a 36-acre lake for this entertainment. We have an outdoor screened-in kitchen with a 60-foot table on one side for the white employees and their families and another on the other side for the Negro employees and their families.

Through treating our employees in this manner, we have received 100-per cent. coöperation from them and they show their appreciation by taking a great pride in doing their jobs well and to our satisfaction.

Crushed-Stone Producers Meet in Cincinnati for Fifth Time in 9 Years

FOLLOWING a welcome by the mayor of Cincinnati, the twenty-fourth annual convention of the National Crushed Stone Association opened at the Netherland Plaza in that city on January 20. It was the fifth time in nine years that the organization had met in Cincinnati.

At the conclusion of his opening remarks to the convention, President J. A. Rigg presented a report on business conditions throughout the country, based on information received from prominent crushed-stone producers in various sections of the United States. In 1940 the building of highways absorbed from 40 to 80 per cent. of the total production of aggregates, depending on the section from which the report came. In some plants 35 per cent. of the output was agricultural limestone. Generally the demand for crushed stone was still below the production capacity of the industry.

In most areas there was no decline in prices and none is expected. The volume of highway construction is not expected to fall even in sections where defense projects are in progress.

There have been scatterd cases of railway-car shortages but the lack has not yet reached serious proportions. It is considered likely that whatever difficulty exists will be increased by the growing demands of products needed for national defense.

Almost every section has felt the effects of the defense program in increased business and these are certain to increase. As yet no delays in the shipment of machinery have been encountered but there has been some difficulty in getting repair parts.

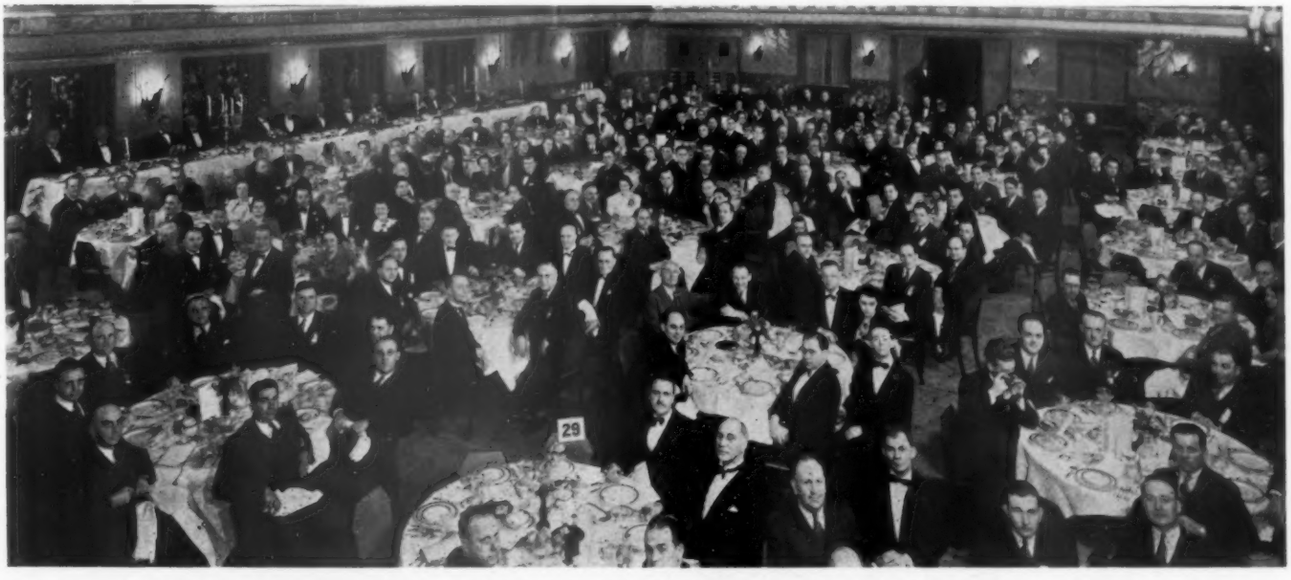
The diversion of highway funds to other-than-highway purposes continues to be serious, particularly in the East. In Pennsylvania highway funds are still being borrowed for use for purposes other than highway building and maintenance, but repayment is being made, even though not as rapidly, perhaps, as the borrowings increase. In the south central region there is no diversion and the same is true in the northwest, where there is strong organized effort against it. In the central region some states are making improper use of highway funds, while other states are respecting the purpose for which the money was gathered. In the northern region only one state is misusing its funds, while in the middle western region there is only "some" diversion.

As a method of bringing younger members of the crushed-stone industry into the administrative ranks, the board of directors at its last midyear meeting appointed a Welfare Committee. The purpose is the bringing together of men from among whom must come the future heads of the organization, men who can take the places of those who retire from the scene of active participation in the affairs of the organization. P. R. Anderson is chairman of the committee.

The report of Engineering Director A. T. Goldbeck, which is usually written, this time took the form of an *ex tempore* discussion of some of the problems encountered in the construction of flexible pavements. A flexible roadway is one which can not resist the bending strains imposed upon it as can the concrete type of road. When the subgrade fails, the flexible road surface lying on it goes down with it.

In an effort to design a flexible road that will sustain the traffic placed upon it, the laboratory of the association conducted a series of tests, using equipment designed by Mr. Goldbeck. As the pressure exerted upon a pavement by a rubber tire rolling over it is practically uniform over the entire area of contact, wooden blocks representing the oval shape of the area of contact produced by the pressure of a single rubber tire on the highway surface were pressed down by a hydraulic jack on flexible pavements laid on different kinds of subgrade, and readings were taken. From these several charts were drawn and corresponding equations developed covering the various conditions encountered. The results of these studies make it possible to say how thick a given type of pavement should be made to support various wheel loads on subgrades having different characteristics.

In his review of the activities of the association during the past year Administrative Director Boyd referred to



One of the highlights of the Twenty-fourth Annual Convention of the National Crushed Stone Association was the banquet on January 21.

Left to right: Bryant Currier, W. S. Tyler Company; C. E. Robinson, American Limestone Company, Harriman, Tennessee; W. M. Bolding, Campbell Limestone Company, Liberty, South Carolina; C. T. Millice, Watauga Stone Company, Watauga, Tennessee; R. P. Immel, American Limestone Company; H. A. Johann, Frog, Switch & Manufacturing Company; Fred Braun, W. S. Tyler Company; W. B. Couch, Campbell Limestone Company.

the outlook for highway construction as affected by the defense program. There are, he said, 75,000 miles of roadway that need improvement to make them adequate for the sustaining of the newer and heavier loads that military activities are likely to place upon them. Powder plants, cantonments and other facilities placed in remote locations away from centers of concentrated population must be made accessible by "access" roads and this will result in much new construction. Although President Roosevelt in his defense budget called highways a non-defense item, it is almost certain that the present Congress will provide the funds necessary for an adequate defense highway program. In his allocation of federal-aid highway money, as reported in PIT AND QUARRY, January, 1941, page 89, J. M. Carmody, has given consideration to the need for building and improving strategic highways.

Defense construction, in Mr. Boyd's opinion, will reach some $2,000,000,000 by the first of June, and of this amount at least half is now under contract. These and other current estimates of the amount of defense construction are certain to be too low. Mr. Boyd expects at least $80,000,000 to be spent for crushed stone and sand and gravel, about $26,000,000 going for crushed stone. Airports, in his view, constitute a real market for crushed stone; especially as Mr. Goldbeck's design for airport pavements has already been favorably received by government officials.

In its work dealing with agricultural limestone the association committee responsible decided to appoint additional committees, one for each of the Agricultural Adjustment Administration regions, so as to harmonize recommendations with local conditions and needs. One of these committees has already reported to the A. A. A. The government is being urged not to disrupt the customary ways of doing business.

Mr. Boyd recalled the conditions with respect to transportation that prevailed during World War I, a situation that he termed a "nightmare." No such conditions exist to-day, but the situation may change rapidly. Meanwhile the association will watch carefully to see that the crushed-stone industry suffers no injustices through the adoption of unfair priorities.

He also said that Otho M. Graves, who has been a member of the board of directors of the National Association of Manufacturers, which for four consecutive years has recognized the National Crushed Stone Association as one of the three trade associations represented on its board, has been made chairman of that group.

Speaking for the executive committee of the crushed-stone association, Stirling Tomkins reported on the present status of the determination of prevailing minimum wages for the crushed-stone industry under the Walsh-Healey Act. He told of the first panel meeting in Washington nearly two years ago and of the report which was presented to the administrator of the Public Contracts Division of the United States Department of Labor on May 1, 1940. At that time Stanton Walker, director of engineering of the National Sand & Gravel Association, collected wage data on behalf of the three aggregates industries — crushed stone, sand and gravel, and slag. The division also made a study, arranging its data by states and thus, apparently, adopting those political subdivisions as the equivalents of the "localities" mentioned in the law. The study presented by Mr. Walker had contained certain recommendations which were largely eliminated in the revised presentation which he offered later. So far, according to Mr. Tomkins, the Division of Public Contracts has not acted upon the data submitted and no determination of "prevailing minimum wages" for the crushed-stone and other aggregate industries has been made.

Otho M. Graves, on behalf of the executive committee, presented a report on the status of the association's request for seasonal exemption of the northern branch of the crushed-stone industry from the provisions of the Fair Labor Standards Act of 1938. A year ago, during the last crushed-stone convention in St. Louis, news was received of the Wage and Hour Division of the United States Department of Labor having granted such exemption to a similar branch of the sand-and-gravel industry, and a plea for reopening that case was made by the crushed-stone association within the statutory 15-day period. This plea was later withdrawn, in spite of the grant of an extension of time, and a new plea founded on different grounds was made. This was granted and portions of the crushed-stone industry are now operating with the special exemption granted by the law to those whose business is seasonal.

The greeting luncheon Monday noon was presided over by F. O. Earnshaw (Carbon Limestone Company, Youngstown, Ohio). According to the speaker, Ray Tucker, newspaper columnist, we will be in the war by June. He also dwelt on our lack of offensive and defensive weapons and described the various ways in which Hitler might invade England. In closing he predicted that there would be good business temporarily.

Otho M. Graves (The General Crushed Stone Company, Easton, Pennsylvania) presided over the Monday afternoon meeting. The first speaker was Roy W. Crum, director, Highway Research Board, Washington, D. C., and his subject was *The Importance of Research to the Crushed-Stone Industry*. Mr. Crum first referred to the early 19th century when land travel was an ordeal of mud, dust and other inconveniences. Much of the credit for the improvement of travel conditions and roads since that time, he said, was due to the work of a researching Scot, one John Loudon Macadam, after whom that type of road is named.

According to Mr. Crum, no industry can progress without research. The word "research," he added, is much misused, and most people think of it

in terms of test tubes, testing machines and laboratories. In his opinion research goes much beyond that, meaning any study which brings out previously-unknown facts, and interprets them, and applies them for the benefit of mankind. Since 1920 the use of crushed stone has been multiplied about four times in volume and three times in value. The expansion in road work gave crushed stone its opportunity, but research made it possible for the industry to expand in a highly-competitive market.

Mr. Crum then traced the growth of knowledge of the design of concrete which makes it possible to-day to proportion mixtures with a certain knowledge of their strength and the cost of the ingredients. An example, he said, was the development of stone sand which, after years of research, is now recognized as a useful material.

Among the important studies at this time, said Mr. Crum, is the effect of water on bituminous pavements and the association's laboratory has contributed important findings on this subject. The necessity for research in this field, he said, is due largely to the fact that there are many types of bituminous binders and their behavior is variable enough to present a constant problem to producers. Of primary importance in this field is the necessary thickness of flexible-type surfaces. After many years of research, scientific methods of design are beginning to emerge and the crushed-stone association's laboratory has led in this work.

At last, said Mr. Crum, there is a prospect of concerted and adequate attack on the exceedingly important problem of the factors that affect the durability of Portland-cement concrete. A joint research project on the durability of concrete has recently been organized by the A.C.I., the A.S.T.M., and the Highway Research Board, and Mr. Goldbeck is a member of the administrative committee. Other things to be studied, he said, include the gradation of mineral aggregates, the effects and control of flat and elongated particles, surface coatings, the relation to durability of the thermal expansion of stone particles, roughness, absorptive properties, hardness and unsoundness. Further investigation of the factors that influence the adhesion of bitumen to rock particles is also necessary.

In closing Mr. Crum stressed the necessity of carrying on and expanding research on all vital subjects. Research is more important than ever before in our history because progress is necessary to the continued security of this nation. He quoted a current slogan by saying that, "if to be free we must be strong and if to be strong we must be productive," then to be productive we must study and delve for new facts, and learn to apply them as never before.

A. M. Philleo, resident engineer, United States Engineers Office, War Department, Denison, Texas, was unable to be present so his paper, *Concrete Construction for Outlet Works, Denison Dam, Texas,* was presented by B. R. Smith, civilian engineer on this project. On this undertaking, said Mr. Smith, aggregates were chosen by a process of elimination. A good deposit of sand was found not far from the dam but coarse aggregates in the immediate vicinity were not satisfactory. Finally, after considerable investigation, the contract for 320,000 tons of crushed stone was awarded to the Southwest Stone Company which is supplying it from its plant at Stringtown, Oklahoma, over 50 miles away.

In designing concrete for this dam the best results were obtained with 4 sacks of cement per cubic yard and 7 gallons of water per sack. A smoother surface and greater resistance to wear were obtained than with richer mixes. Mr. Smith also described shipment of the stone in two sizes and the facilities for storing and handling it at the dam.

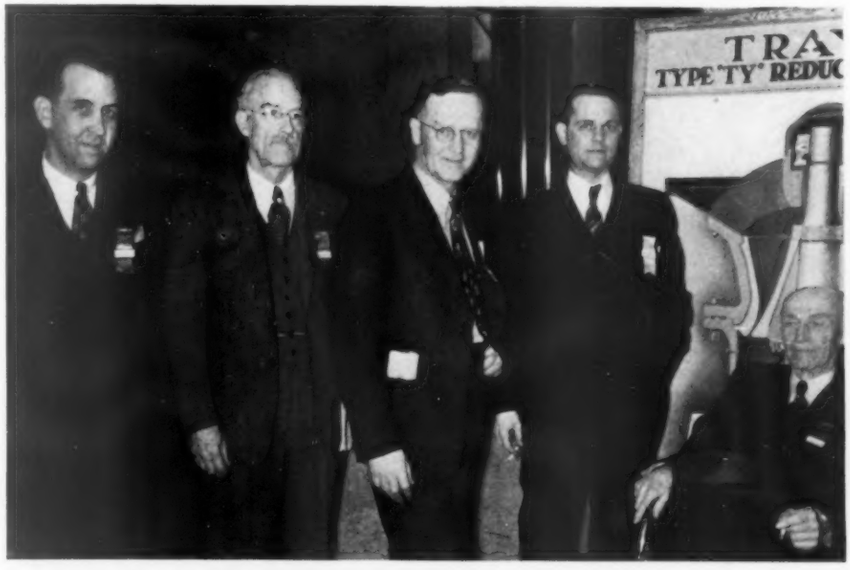
The final speaker was R. S. Smethurst, associate counsel, National Association of Manufacturers, Washington, D. C., who discussed *Federal Legislation Affecting the Crushed-Stone Industry*. He showed the extremes of reasoning which make almost any industry or plant interstate and subject to the rulings of the various acts controlling labor relations, etc. In his opinion the national-defense program will be carried out without sacrificing any of the social gains which have been made in recent years and industry is to-day even more "on the spot" than in the past seven years. We can expect some basic new legislative developments but instead of looking to the Congress for them as in former years we must now look also to the many federal departments. The Interstate Commerce Commission, for example, now has the power to give priority in shipment at any time.

According to Mr. Smethurst, the Walter-Logan bill is to be revived and is now awaiting a committee report. It is expected that the most objectionable features of this bill will be eliminated. The next few months, he predicted, will see further expansion of social-security activities and moderation and extension of exisitng labor laws. He also foresees an attempt to provide federal health insurance and silicosis benefits and perhaps the taking over of state industrial compensation.

The number of current strikes is far below last year, according to Mr. Smethurst, but every one now makes the headlines. He predicted that there might be legislation to prevent strikes on defense work. No legislation which would restrict industry in its effort to meet defense demands is expected and much old legislation may be discarded. Industry will be closely watched and its treatment will depend largely on its attitude and willingness to coöperate.

In response to questions Mr. Smethurst said that the Walter-Logan bill is designed to make uniform the action of government agencies and to standardize procedure to insure a fair hearing. He believes the sentiment in the Congress is such that the bill could be passed over another presidential veto.

Harold L. Williams, member of the Boston bar, said American industry can



Left to right: C. H. Roberts, Traylor Engineering & Manufacturing Company; W. E. Hilliard, New Haven Trap Rock Company, New Haven; B. L. Prater and M. E. McLean, East St. Louis Stone Company, East St. Louis, Illinois; L. A. Rice, Traylor Engineering & Manufacturing Company.

W. R. Sanborn, Lehigh Stone Company, Kankakee, Illinois, and Martin Hammerschmidt, Elmhurst-Chicago Stone Company.

and will face the challenge of the present situation in Europe but that industry's attitude must change before a really concerted effort can be made. He said that we must now think of legislation in terms of its effect on our ability to do what is expected of us.

At this point Mr. Graves introduced a guest, Charles Hook, president of the American Rolling Mills Company, and a former president of the National Association of Manufacturers. Mr. Hook agreed with Mr. Williams that our attitude toward government must change in some respects but that the right of free enterprise must be kept. He said that the taking away of hope of reward from those with ambition would destroy the American way of living. He advised coöperation in the defense effort but continuance of constructive criticism. Mr. Hook believes that the fall of England would put the world against us and industry can do much to prevent such a catastrophe.

The next speaker was E. J. Kinney, engineer of designs and specifications, Pennsylvania Turnpike Commission, Harrisburg, Pennsylvania. His subject was *The Pennsylvania Turnpike—An Illustrated Preview of the Highways of To-morrow.* Mr. Kinney said that he was substituting in this assignment for his former superior, S. W. Marshall, who was one of the speakers at the preceding year's convention. Mr. Marshall, he said, is now in charge of defense construction in the Carribean. Mr. Kinney gave a *résumé* of the amount of materials used in the construction of this super-highway and the manner in which they were obtained. Crushed stone was specified everywhere except at the west end of this project, where Allegheny River gravel was available. A motion picture, produced by the Portland Cement Association, was then shown. It illustrated the various phases of construction and the completed highway. Mr. Kinney closed with the remark that the turnpike should be extended from coast to coast.

The Manufacturers' Division of the National Crushed Stone Association held its annual meeting at an 8:30 breakfast which was well attended. Fred Braun (W. S. Tyler Company), retiring chairman, presided and resolutions were read by M. A. Eiben (Northern Blower Company). The new chairman of the Manufacturers' Division is J. Harper Fulkerson (Cross Engineering Company, Carbondale, Pennsylvania). He, with Mr. Braun and L. W. Shugg (General Electric Company, Schenectady, New York), will represent the manufacturers on the board of directors of the association.

Vice-chairmen of this division are: W. M. Black (American Manganese Steel Division of the American Brake Shoe & Foundry Company, Chicago Heights, Illinois), M. A. Eiben (Northern Blower Company, Cleveland, Ohio), E. J. Goes (Koehring Company, Milwaukee, Wisconsin), F. O. Reedy (Kennedy-Van Saun Manufacturing & Engineering Company, New York City), and Frank B. Ungar (Ludlow-Saylor Wire Company, St. Louis, Missouri).

The new directors of the Manufacturers' Division are: J. C. Farrell (Easton Car & Construction Company, Easton, Pennsylvania), L. C. Mosley (Marion Steam Shovel Company, Marion, Ohio), R. C. Johnson (Simplicity Engineering Company, Durand, Michigan), Milo A. Nice (Hercules Powder Company, Wilmington, Delaware), C. H. Roberts (Traylor Engineering & Manufacturing Company, Allentown, Pennsylvania).

The retiring directors are: F. E. Finch (formerly of the Hardinge Company, York, Pennsylvania), A. E. Forster (Hercules Powder Company, Wilmington, Delaware), H. T. Gracely (Marion Steam Shovel Company, Marion, Ohio), John Swenehart (Atlas Powder Company, Wilmington, Delaware), and S. W. Traylor (Traylor Engineering & Manufacturing Company, Allentown, Pennsylvania).

The Tuesday-morning meeting was opened with a discussion of *Asphalt-Stone Construction for Airport Surfaces,* by A. H. Hinkle, district engineer, The Asphalt Institute, Cincinnati, Ohio. Mr. Hinkle said that bombers and large transport planes require a strong runway surface but that the load imposed does not approach that on highways because of the large tires used in proportion to the load. The chief problem is drainage because of the great width of the runways. For the same reason proper compaction of the subgrade is necessary and he recommended water-bound macadam for this purpose. He also recommended the use of penetration road-mix or plant-mix for this purpose or a combination of both. A 120- to 150-penetration bitumen should be used, because the danger of wear slickness was much less than on highways. One absolute requirement is that the surface be entirely free from loose stone.

The color of a runway is not important, according to Mr. Hinkle, but it might become so in case of war. In this event a coating of asphalt and screenings can be used to give a light surface and a dark surface can later again be made by applying asphalt alone. Another advantage of asphalt for this type of construction, he said, was that it lends itself very well to stage construction. A series of slides were then shown to illustrate the use of asphalt in airport and highway construction.

In the absence of A. M. Miller, West Virginia State Road Commission, the discussion of this paper was led by R. R. Litehiser, Ohio State Highway Department. He described work of this type done recently in Ohio.

Present-Day Industrial Relations was the subject scheduled for discussion by C. S. Ching, director of industrial and public relations, U. S. Rubber Company, New York, who was unable to be present because of illness. Instead S. M. Shallcross (American Lime & Stone Company, Bellefonte, Pennsylvania) discussed *Merit Rating.* According to the speaker, experience rating for unemployment insurance presents a serious problem for the producer because of its social and political phases. So far 40 states have adopted experience ratings varying from nothing to 4 per cent. According to Mr. Shallcross stabilized employment is vital to the quality and capacity of output and experience rating is now being applied to nearly all industries including building. It may even smooth out to some extent the usual severe winter slump in the demand for aggregates.

J. R. Callanan, Callanan Road Improvement Company, South Bethlehem, New York, whose excellent piano playing contributed to the pleasure derived by many from this meeting. James E. Gray of the National Crushed Stone Association was one of the many listeners.

Pay-roll taxes Mr. Shallcross considers

to be a mistake but he predicted that they would be increased. He said that the profit motive must survive and if the experience rating helps to do this it should receive the backing of industry. He condemned the spreading of an average rate among all states as being unfair to those having the best experience, and advised that efforts be made to stop any such move before it gets too far under way.

In the absence of C. A. Hogentogler, senior highway engineer, Harold Allen, materials engineer, Public Roads Administration, Washington, alone presented their joint discussion of *Mechanical Stabilization of Subgrades and Bases*. Mr. Allen introduced this subject with a brief description of the use of crushed stone as a subgrade and base for bituminous pavements and mentioned other outlets in low-cost and service roads.

According to Mr. Allen, standing loads may damage flexible-type roads much more than heavier rolling loads because of faulty subgrades. He also described experience with soil-stone mixtures and said screenings are an ideal ingredient for this type of subgrade. He advised research to determine the best types of crushers for making this type of material. The best results are obtained by separating the stone into three fractions and recombining them in the desired proportions. Minus 200-mesh material is important in this type of aggregate as it serves as a binding agent in base courses.

The session was closed with a report of the auditing committee, followed by the report of the nominating committee and the election of officers.

The following officers were reëlected: *President,* J. A. Rigg, Fort Spring, West Virginia; *treasurer,* William C. Hilliard, New Haven, Connecticut; *administrative director,* J. R. Boyd; *engineering director,* A. T. Goldbeck.

The following regional vice-presidents were reëlected: *Eastern,* W. M. Andrews, New Castle, Pennsylvania; Southeastern, W. T. Ragland, Raleigh, North Carolina; *Central,* W. C. Sparks, Princeton, Kentucky; *Northern,* A. J. Cayia, Manistique, Michigan; *Western,* A. J. Wilson, Watsonville, California; *Northwestern,* Porter W. Yett, Portland, Oregon. George Hammerschmidt, Elmhurst, Illinois, replaced N. E. Kelb in the Midwestern Region and W. F. Wise, Dallas, Texas, replaced R. S. Wilson in the Southwestern Region.

All the directors were reëlected except Harold R. Brownson, N. E. Kelb, Roy Wills, R. S. Wilson and the late T. I. Weston. New directors are: T. C. Cooke, Swampscott, Massachusetts; I. A. Ogden, New Braunfels, Texas; W. S. Weston, Columbia, South Carolina; D. L. Williams, Ripplemead, Virginia. Fred Braun, Cleveland, Ohio, and L. W. Shugg, Schenectady, New York, were reëlected as representatives of the Manufacturers' Division on the board of directors and J. Harper Fulkerson, Carbondale, Pennsylvania, was elected as the third representative.

Perry A. Fellows, chief engineer, Works Projects Administration, Washington, spoke in defense of W.P.A. activities in relation to national defense in an address entitled *National Defense and the W.P.A. Construction Program*. He said that his agency was building not only facilities for national defense but also the morale of the people by providing remunerative employment. W.P.A. projects of significance in the defense program are: (a) projects sponsored by the Army and the Navy, and (b) projects of military value sponsored by states, counties, and cities. In the first class the W.P.A. has been building and improving military reservations and naval stations since 1935. In recent years over half of all W.P.A. workers have been employed in the building and maintenance of highways. The experience of every warring nation in Europe has shown clearly the military importance of good roads.

The W.P.A. program is flexible to the extent that it can be adjusted in ways that care for the military needs of the country as well as the unemployment situation. He cited airports in Maine as an example. These have been built in numbers and sizes with sole regard to their value as defense measures and entirely out of proportion to the relief needs of the state.

The W.P.A. employs about 1,800,000 men who are paid $64.50 each per month. The amount of money which the W.P.A. is allowed under the law to spend for materials, machinery and supplies is limited to $6.00 per month per man. It is quite evident, Mr. Fellows said, that the government is compelled by the provision of the law to produce some of its materials and to do with manual labor much work that could be done more cheaply by machinery.

On the extent to which the W.P.A. competes with private industry Mr. Fellows pointed out that sometimes it provides the labor needed to produce the stone, each case being determined on its own merits with due regard to local conditions. He said that the government has no desire to compete with private industry and that its activities do not constitute competition. He described competition as of two kinds: (a) that between opposing forces (such as that between one business concern and another), and (b) that between those working for a common goal (such as that between the government and business striving to eliminate the social and financial burdens of unemployment). Each contemplated case of competition with existing stone-producing plants, for example, must be judged fairly in the light of prevailing conditions.

James D. Marshall, assistant managing director, Associated General Contractors of America, Inc., talked about *Contractors and National Defense*. He referred to construction activity as the first step in defense. The volume of all construction work for defense purposes he placed at $15,000,000,000, of which $1,500,000,000 could be said to be due to "pure" construction. Two-thirds of the latter amount is under contract.

Mr. Marshall said that the defense-budget estimates might be doubled and that almost every community will feel the demand for some kind of construction. The construction industry, he said, can handle the work given it, if present business methods are not changed. Centralized purchasing may

Left to right: J. C. Farrell and G. D. Fraunfelder, Easton Car & Construction Company; Nelson Severinghaus, Consolidated Quarries Corporation, Lithonia, Georgia.

obstruct the successful working out of the program, he believes.

There is nothing in the defense budget for defense highways, in spite of the fact that surveys have been made to show where these highways should be built.

Mr. Marshall does not believe that the construction volume "peak" of $10,600,000,000, reached in 1927, will be attained in 1942 despite $3,000,000,000 worth of defense work.

Ten years ago those who attended the crushed-stone convention in St. Louis were entertained and instructed by a racy dialogue between two exponents of rationalization in personal selling. Professors Busse and Nyberg composed the team. This year Professor Busse returned with a new team mate, Professor Ralph S. Zink, and the two men, using a new theme and, of course, new dialogue, injected a note of humor into a session that otherwise was serious.

To the six principles of sound selling presented by Professor Busse and Nyberg a decade ago in their dramatized lecture, *How to Win an Argument* (see PIT AND QUARRY, April 22, 1931, pages 34 to 36 and 41), Professors Busse and Zink added two more:

1. If you want your next sales presentation to stay presented, regard your prospect as an audience and yourself as a popular lecturer.

2. When you present the "For instances" in the body of your presentation, present them as a course dinner, not goulash.

The organization formula for the first principle Professor Busse broke down into four steps:

Step 1. Ho hum!
Step 2. Why bring that up?
Step 3. For instance!
Step 4. So what?

Left to right: R. W. Crum, Highway Research Board, Washington; A. T. Goldbeck, National Crushed Stone Association; S. A. Phillips, Pit and Quarry.

He illustrated these steps by the use of an ordinary match, of which the phosphorus tip provides the initial fire (step 1), the sulphur provides the connecting fire (step 2), that ignites the wood or body of the match (step 3), leading to the use made of the fire (step 4).

The salesman's first task is to rouse the prospect from his ho-hum attitude, his indifference, his unwillingness to be disturbed. "You want your match to light with the *first* scratch," said the professor. Knock the ho hum with the first sentence you utter is his advice.

The second step is to build a bridge from your subject, announced in your opening statement, "to the little island of personal interests on which your listener lives," according to Busse. He emphasized the fact that the sulphur bridge of the match, which carries the flame from the phosphorus tip to the wood body, is not in the middle of the match or at the end opposite the tip, but it is the *"second step in the organization of a match."* This step, by providing facts of interest to the prospect and having a direct bearing on his problems, answers his spoken or unspoken question, "Why bring that up?"

The third step covers the prospect's natural desire to hear about examples of the ways in which the product offered him will be helpful, the reasons why he should want it. "About once a minute," advises the professor, "repeat that magic phrase, 'For instance.'" And, he continues, "make your next sales presentation a parade of 'for instances,' of 'for instances' in colorful word uniform. Everybody likes a parade."

And when the last concrete 'for instance' has marched by, "move swiftly and surely into your last step: So what? . . . Ask for sharply-defined action."

This organization plan was dramatized by having Professor Zink, now acting as a dictating-machine salesman, make a series of calls on a railroad company to which he hopes to sell $30,000 worth of equipment. On his first call he presents a convincing fact-and-figure story of savings that can be effected by the substitution of dictating machines for stenographers. When the office-manager prospect is about to wonder "So what?", the salesman suggests that an amplified form of the same data be presented to the prospect and other interested executives at 2:30 the next Thursday.

On that day at the appointed hour he presents his story, dramatized with visual aids, to the group, and just as the members of it are about to ask themselves "So what?", he suggests making a survey of the prospect company's correspondence costs at no expense to the prospect and promises the written report "on February 3rd."

And on February 3rd he again addresses the executive committee, presenting the report which shows that the company could effect important savings through the use of dictating machines. And, again, just as the committee begins to wonder "So what?", he suggests a proof-period demonstration in the company's office, asks that one department be selected for the trial, and promises the final data necessary for a decision on March 1st.

And, on March 1st, when the committee sees the results of the trial and then mentally asks "So what?", the answer is simple: "Gentlemen, buy!"

According to principle 2 enunciated by the professor, it is a course dinner which the prospect wants, not goulash. To dramatize this point Professors Busse and Zink call together on Mr. House-owner, Zink doing the talking, Busse obligingly displaying the visual aids—a series of large cards, each presenting a single talking point for oil heat: "Health," "Drudgery," "Economy," "Cleanliness," "Added Floor." As Zink speaks on each point, Busse raises the proper card. Zink's discussion becomes rambling, touching first one point, then another, returning then to the first, and jumping to the last one, while Busse pulls out first one card, then another, still another, then tries to locate the first one, then holds them all aloft, and finally, in despair, lets them all fall to the floor—a practical demonstration of lack of organization in the salesman's thinking and talking.

Left to right: Kenneth Lindsay, Iowa Manufacturing Company; F. O. Earnshaw and J. H. Jackson, Carbon Limestone Company, Youngstown; Paul B. Reinhold, Reinhold & Company, Inc., Pittsburgh.

And as the convention audience thought its own silent "So what?" Busse said: "These principles we have given you may not impress you as scholarly; they may not impress many of you as being particularly new. But they do have one homely virtue to recommend them: *They just happen to work*.

"And because they do happen to work, our answer to your 'So what?'

is simply this: *Use them!* Use them, beginning tomorrow. If you do, your sales presentations will have a better chance of staying presented."

After the laughter and applause subsided Otho M. Graves, chairman of the resolutions committee, presented several expressions of the feeling of the convention, one dealing with the recent death of T. I. Weston, a former president of the association.

The Wednesday afternoon group meeting for superintendents and operating men was one of the most interesting and best-attended meetings of the entire convention and the subjects discussed aroused spirited and enlightened discussion. A. L. Worthen (New Haven Trap Rock Company, New Haven, Connecticut) presided at this meeting.

Stock-piling and Reclaiming was the subject of the first discussion by Nelson Severinghaus (superintendent Consolidated Quarries Corporation, Decatur, Georgia). Mr. Severinghaus used a typical plant of 100-tons per hour capacity to illustrate the dilemma its operators would be in if confronted with a sudden demand far beyond the capacity of the plant and its storage facilities. A stock-pile, he said, is the only practical insurance against such a possibility. A table was used to illustrate the five commonly-used methods of stock-piling and their comparative advantages and disadvantages in the order of importance.

Stock-piles with a capacity in excess of normal requirements, according to Mr. Severinghaus, need to be handled only once or twice yearly and can therefore be most economically rehandled by means of a scraper system. He illustrated his point by describing the system used at the Rock Chapel plant under his supervision. Materials are stored by means of three 100-foot conveyor galleries into piles of 30,000 tons capacity. About half of this material can be reclaimed by gravity through the central tower to the loading belt conveyor. Three cable scrapers and a clam-shell crane are used to handle the material in dead storage. Any excess material in the larger sizes is returned to the crushers in trucks. Cleaning and rerinsing screens are used to remove dust before loading out any material.

	Conveyors	Cable Drags	Clam-shell Buckets	Motor Vehicles	Bulldozers
First Cost	5	1	4	3	2
Operating Cost	1	3	2	4	5
Breakage of Stone	1	4	2	3	5
Flexibility of Amount	5	3	4	1	2
Flexibility of Hourly Capacity	1	3	3	2	3
Operating Labor Requirement	1	2	3	5	4
Ease of Change of Location	5	3	4	2	1

In the discussion that followed, R. W. Cunningham (superintendent Canada Crushed Stone Corporation, Hamilton, Ontario), told of the huge construction program in Canada which included 80 airports and a superhighway. The government coöperated with producers by arranging its mixes so that waste was almost entirely eliminated. At one of the plants under his supervision, he said, a tunnel-reclaiming stock-piling system and a recleaning plant were installed. A bulldozer is used to reclaim from dead storage. This plant, he said, has a capacity of 2,400 tons in two shifts. The stock-piling system made it possible to ship from this plant 175,000 tons of material in one month with a peak of 9,000 tons in one day.

According to Mr. Cunningham the one disadvantage of the conveyor method of stock-piling is the segregation which apparently can not be avoided. Rescreening before loading was the only solution and this was done with two 2-deck screens arranged so that each deck can be used for a different size of stone. Undersize only was screened out, he said, as it is impossible to screen out oversize.

One producer present said certain of his customers will not accept stock-piled stone for bituminous work because it has a higher moisture content than stone stored in bins. Mr. Seitz replied that in his experience stone stored any length of time in stock-piles is acceptable for most purposes, including bituminous paving. However, he said, they discontinue selling dry stone when it rains. The cost of stock-piling stone, according to several of those present, varies from 1 to 5 cents per ton and the cost of reclaiming varies from 3 to 15 cents, depending on methods and conditions.

Drilling and Blasting Practices was the subject introduced by A. J. Cayia (Inland Lime & Stone Company, Manistique, Michigan). When this quarry was first opened, said Mr. Cayia, the technical representatives of three different powder companies were called in for consultation. Their recommendations differed on almost every detail. The first shot was made with 4,000 6-inch holes in 6 rows. Then 5 rows were used, next 3 rows and finally 2 rows were found best for track movements and other conditions peculiar to this quarry. Now single-row shots with larger holes are being tried and may be adopted. Complete records are made of each shot giving a graphic account of digging conditions

T. W. Matchett, Robins Conveying Belt Company; R. W. Cunningham, Canada Crushed Stone Corporation, Ltd., Hamilton, Ontario; D. C. Hickey, General Crushed Stone Company, Syracuse; A. E. Conover, Robins Conveying Belt Company.

Left to right: J. H. Fulkerson, Cross Engineering Company; Fred Braun, W. S. Tyler Company; L. W. Shugg, General Electric Company.

Left to right: H. E. Rainer, Federal Crushed Stone Corporation, Buffalo; James Savage, Buffalo Crushed Stone Corporation, Buffalo; F. O. Earnshaw and J. H. Jackson, Carbon Limestone Company, Youngstown.

for future reference. The shovel operators' reports are also important and the amount of fines produced is also recorded because this company is primarily a producer of flux stone.

When all information is ready for the next shot the explosive experts are called in for their recommendations. If they fail to agree on methods, each is given charge of a separate section of the quarry which is drilled, loaded and detonated under his supervision. According to Mr. Cayia the results have improved since this method was adopted.

J. Q. Taylor (general superintendent New York Trap Rock Corporation, Newburgh, New York), gave the results of drilling tests made at the company's four quarries, each in a different type of rock. Each shot is limited to 4,000 pounds of explosive and, said Mr. Taylor, it is sometimes difficult to lay out an effective shot with the high faces in these quarries. Efforts are made to shoot the holes as dry as possible and different blasting methods are used for riprap than for regular crushed stone. In these four plants, according to Mr. Taylor, 555,099 pounds of explosive was used last year to bring down 3,619,000 tons of stone and these figures included secondary shooting.

J. H. Jackson (vice-president and general manager Carbon Limestone Company, Youngstown, Ohio), said that his company does no well-drilling because the face averages only 20 feet in height. The stone is in 4-foot ledges and drilling is done with wagon-drills. Jackhammer holes are used between the larger holes and all are detonated at once. With this system very little secondary shooting is necessary.

T. C. Cooke (president Lynn Sand & Stone Company, Swampscott, Massachusetts), said that the attempted appeasement of complaints on blasting is a dangerous practice as conditions then become worse. A. G. Seitz mentioned a case in which the size of a shot was voluntarily decreased and more complaints were received than ever before. Another producer near a large city told of being restricted to 400 pounds of explosive per shot. Another producer told of cutting down shots from 9 holes to 2 or 3 with an increase in the number of complaints. This condition, according to Mr. Cooke, is due to the fact that small shots are more frequent. His experience with smaller shots is more complaints but less damage to pay for.

A. L. Worthen said his company's practice for the past three years has been to have Dr. Lee, seismologist of Harvard University, present at each shot made in its four plants. Dr. Lee's advice is followed in planning future shots. R. D. Brewer (New Haven Trap Rock Company) said that when a complaint is received a policeman is stationed at that point when the next shot is made and it is found that there is usually nothing to complain about.

The next scheduled paper was *Economics and Practicability of Dust Control* by A. G. Seitz (vice-president in charge of operations General Crushed Stone Company, Syracuse, New York). In opening, Mr. Seitz reminded those present of a meeting held in Cincinnati in 1930 and a paper given by Mr. Earnshaw for the Committee on Mechanical Elimination of Dust. This report covered the removal of dust from products but did not take into consideration its effect on working conditions or on neighbors. Now, he pointed out, codes are being established in New York State to regulate and control dust and it is entirely likely that control of dust will be eventually required in most states.

The type of collector to be used, the volume of air, pressure, distribution or location of pipes, etc., are matters to be worked out individually for each plant, said Mr. Seitz. He also made it clear that in his discussion he was attempting to cover only his own experience with dust-collection and the types of collectors used by his company. At present it has in use five water-box or hydraulic collectors, eight cyclone collectors, and two cloth-bag collectors. While dust-collection was, of course, the major problem, the disposal of the collected dust also presented many difficulties. Where the fine dust can not be sold he advised the use of water to form a sludge which is comparatively easy to dispose of. In one plant where a hydraulic collector was used the sludge was settled to a certain extent and the water returned to the collector.

The first dust collector installation made by his company, said Mr. Seitz, was in a bituminous-concrete plant. A cyclone-type collector was installed which collected the coarser particles but the finer particles went out the stack and created a nuisance farther away than before. This type of collector he recommended for use where the dust could be sold and where nuisance value need not be considered.

F. O. Reedy, Kennedy-Van Saun Manufacturing & Engineering Company, center, and two convention visitors.

A new type of collector was then tried at another bituminizing plant but was later replaced with a cloth-bag collector. This turned out to be too small and was not insulated so it in turn was replaced with a larger cloth-bag collector. This was installed in series behind the original cyclone collector and solved the dust problem in this plant, where fines sometimes run 85 per cent. through 325-mesh. The disposal of this dust, said Mr. Seitz, remained a problem. Provision was made on this collector for thermostatic control of the temperature of air entering the collector by admitting outside air. A siren gives a warning if the temperature reaches the point where it might damage the cloth bags.

In another plant, said Mr. Seitz, there was installed a collector which was later replaced by a hydraulic collector which eliminated the extremely dusty conditions. This collector is 9 feet in diameter and 16 feet high and inside it is a layer of coke. Dust enters at the bottom and water is sprayed on top of the coke, washing down the dust which forms a sludge and runs out the bottom. This type of collector is now used in all the bituminizing plants operated by the company, in each case following a cyclone collector from which usable dust is reclaimed. In one plant tests showed that the hydraulic collector alone was collecting 1,200 pounds of dust per hour.

Mr. Seitz went on to describe his dust-collecting experience in crushed-stone plants. The first move was the installation of sprays to dampen the stone as it came from the primary crusher. This gave very satisfactory results and similar sprays have been installed in other plants. Hydraulic collectors similar to those already described have been installed in a number of the company's plants and have been uniformly successful. In some cases, he said, it was actually dangerous to work in the plants before these collectors were installed and their use has met with the unqualified approval of employees. Now it is possible to see clearly in any part of the plant, making it much safer and more pleasant for the employees and also making it possible for them to operate the plant more efficiently. The elimination of this dust, said Mr. Seitz, has also materially increased the life of equipment, much of which is open. The results of present installations have been so satisfactory that all plants operated by the company are eventually to be similarly equipped.

M. A. Eiben (Northern Blower Company) mentioned the application of special dust-collectors on quarry trucks operated by the New Haven Trap Rock Company. F. H. Edwards of that company said these collectors have eliminated much of the former excessive wear in these trucks' engines. Mr. Eiben also mentioned another installation where a collector hood is dropped over a truck being loaded with dust.

One of the two afternoon sessions held on Wednesday was a Group Meeting for Salesmen, presided over by John Rice, Jr. (General Crushed Stone Company, Easton, Pennsylvania).

F. W. Darner, chairman of the Grants of Aid Committee, Agricultural Adjustment Administration, Washington, told of *A.A.A. Policies with Regard to the Grant-of-Aid Program*, now called the Conservation Materials and Service Program. He traced the growth of the program by mentioning that in 1937 approximately 25,000 tons of 43-per cent. superphosphate was distributed to farmers in 10 states, whereas in 1940 over 177,000 tons of 45- to 48-per cent. superphosphate and over 160,000 tons of 20-per cent. superphosphate were distributed in 33 states. In 1941 either 48-per cent. or 20-per cent. superphosphate will be available to farmers in practically every county in the humid areas of the country.

Experimentally the committee distributed small amounts of Austrian winter-pea and hairy-vetch seeds to farmers in North Carolina and Georgia for planting as winter-cover crops and got astonishing results. Due to a shortage of these seeds the acreage of these crops could not be increased, so Oregon farmers, under a promise-to-purchase plan, agreed to coöperate and the results were an 80-per cent. increase in the supply of Austrian winter-pea seeds and an increase of about 100 per cent. in the supply of hairy-vetch seeds. These seeds were distributed to southern and east-central farmers, the total distribution being 40,151,430 pounds of peas, 5,618,100 pounds of vetch, and 1,410,000 pounds of Italian rye grass.

Of agricultural limestone, included in the conservation-materials program in 1938, 38,116 tons was distributed in that year through projects established in 26 counties in 8 states. In 1940 nearly 3,300,000 tons of liming material, mostly ground limestone, was distributed in 29 states.

Mentioning specific cases, Mr. Darner said that in South Carolina in 1936 the A.A.A. paid for the application of less than 6,000 tons of agricultural limestone. In 1940 the A.A.A. distributed over 75,000 tons, while the state's annual requirements are estimated to be 500,000 tons. In 1939 in Missouri the total consumption of agricultural limestone was approximately 440,000 tons; in 1940 the A.A.A. distributed 538,164 tons.

The speaker pointed out that the distribution of these soil-conservation materials is apparently aiding the commercial sale of these products. In Kentucky, where the A.A.A. has distributed large quantities of phosphate since 1937, commercial sales have risen from year to year. Suggestions that the A.A.A. follow a plan of buying which would allow each farmer to purchase his materials from any dealer or manufacturer he chooses can not be adopted because of the rules and regulations arising out of Section 3709 of the Revised Statutes of the United States.

A. T. Goldbeck, the association's engineering director, gave some examples of *How Research Helps Sales*. In spite of all the research and investigation that has been made of crushed stone, difficulties sometimes arise, some objection to quality, some doubt as to economic suitability, some question as to whether one or another size might be more desirable. If new uses for crushed stone are to be developed, said Mr. Goldbeck, its suitability for those uses must first be established and this can be done only by research.

When concrete roads were first built and for many years thereafter it was customary to state the proportions of concrete in terms of arbitrary, loose volumes of the respective ingredients, as 1:2:4 or 1:2:3½. This method of proportioning placed stone under a severe handicap, especially in competition with gravel. As the apparent volume of sand changes as much as 25 per cent. by reason of its varying moisture content, contractors sometimes find crushed-stone concrete very hard to

M. Bovee, General Crushed Stone Company, Syracuse; Bryant Currier, W. S. Tyler Company; A. G. Seitz, General Crushed Stone Company, Syracuse; Mrs. Fred Braun and Fred Braun, W. S. Tyler Company.

M. A. ("Mike") Eiben, Northern Blower Company trying to break a record—or something.

finish in comparison with concrete made with gravel. Because of crushed stone's higher percentage of voids—by some 7 or 8 per cent.—stone was affected more than gravel. The facts uncovered by a study of this situation corrected it and the difficulty no longer exists.

Mr. Goldbeck also spoke of research activities that overcome troubles by revealing facts, whereas previously rejections resulted from the imposition of assumptions. Problems which have been solved by this method are those involving flat and elongated particles, dust-coated stone, etc. The sodium-sulphate test of soundness, as the result of which some stones have been rejected, is too uncertain and too little in agreement with service records to warrant its acceptance as the final means for rejecting stone alleged to be unsound, according to the speaker.

A. W. McThenia (Acme Limestone Company, Fort Spring, West Virginia) pointed out the desirability of producers making available to their customers and prospects the results of research. Anything that serves to reduce the cost to the buyer is important, he said.

W. E. Hilliard (New Haven Trap Rock Company, New Haven, Connecticut) offered some comments on the importance of research generally. He said that there are 2,400 industrial laboratories in the country, that these employ 70,000 research and laboratory workers, and that an average of $4,000 is spent each year for each of these employees. The average company conducting research spends 2 per cent. of its gross sales for that purpose. He stated that 40 per cent. of the sales of one large chemical company resulted from research and in the case of one building-material manufacturer 42 per cent. He pointed out that 35 trade associations have research departments and that 11 have laboratories — the crushed-stone association is one. He said the question to be answered is not "Can a company afford to use research?" but rather "Can a company afford not to use research?"

George E. Schaeffer (General Crushed Stone Company, Rochester, New York) spoke on *Merchandising Crushed Stone*. His discussion was built around the methods of his company and was accompanied by a printed copy of its "Sales Agreement and Contract." He talked about quotations, customer credit, terms of sale, discounts, acceptance of orders, prepayment of transportation charges, advertising, commission sales, prices, collections, protection of accounts, and the disposition of full production.

In discussing *The Salesman's Part in Coördinating Shipments with Plant Production* Paul R. Anderson (Marble Cliff Quarries Company, Columbus, Ohio) said that every salesman should be well-informed about the capacity of his company's plant, its screen sizes, the locations and approximate amounts usually carried in stock-piles, and the ability of his plant to operate under various weather conditions. He emphasized the value of having customers acquainted with the plant superintendent as a means of becoming familiar with some of the producer's problem and lessening complaints and eliminating unreasonable demands. However, this policy should not be allowed to develop to the point where the salesman disappears from the picture or loses his control of the business.

Speaking of the fluctuations in the demand for stone of different sizes, Mr. Anderson said that ballast shipments, which require a grading between 1 and 2 inches, start about April 1 and continue until October 15 in his plant's territory. Road construction requiring larger sizes, from 2 to 4 inches, makes its demands during the same period, so the requirements of both classes of customers can be produced concurrently. Material for the surface treatment of roads ranges from 1 inch down to ¼ inch and is in demand from the middle of June until October 1. If the operating department is kept informed of the amounts and sizes of material needed, it can prepare itself to supply them during the operating months of April, May, October and the first half of November.

The salesman can do much to educate customers in the possibilities of pouring concrete in winter, a procedure facilitated by the use of patented admixtures. The W.P.A. has shown that there should be no seasonal building of macadam roadways by operating in all 12 months of the year, with no exorbitant increase in cost in the winter season.

Agricultural limestone is a product which should absorb all the surplus materials below ¼ inch in size. The demand for this product is a spring and autumn phenomenon.

Just before adjournment the audience was shown a motion picture called "Green Acres," a production of the National Lime Association illustrating the benefits that accrue from the proper liming of various soils.

At the Tuesday lunch meeting E. A. Tamm, assistant director, Federal Bureau of Investigation, Washington, discussed some of the work of the bureau and gave some interesting, unnamed examples of the ways in which the bureau operates and what it learns.

A speech of absorbing interest was that of Dr. Miller McClintock of the Bureau for Street Traffic Research, Yale University, on *Highways and National Defense,* at the banquet Tuesday night. In quiet earnest and without emotional appeal of the usual convention-banquet variety he impressed his listeners with the great importance of an adequate highway system for the use of mobile mechanized military equipment. Highways, he said, unite the nation into a firm, untearable fabric, and immediate and substantial improvement of the defense highway routes of America is an absolute "must" in our defense program.

The women guests of the convention were agreeably entertained by a program of teas, lunches, a visit to the Taft Art Gallery, a dinner in the Continentale Room of the hotel, and a theater party to see Dante, the magician, successor to the famous Thurston.

NSGA *(from page 35)*

ing day had been left free from meetings to enable producers to inspect the exhibits. He said, too, that this exhibition was the largest, both in the number of exhibitors and in the amount of space used, in the history of the association.

Frank O. Wyse (Bucyrus-Erie Company) offered and had adopted resolutions expressing regret for the death of P. W. Gifford (Gifford-Hill & Company, Dallas, Texas) and for the retirement of Francis E. Finch, for many years connected with the Hardinge Company and former vice-chairman of the Manufacturers' Division. The division elected the following officers for the coming year: President, Arthur A. Levison (Blaw-Knox Company); and as vice-chairmen: Theodore Aulman (Eagle Iron Works), Irwin F. Deister (Deister Machine Company), Perry Nagle (American Manganese Steel Division, American Brake Shoe & Foundry Company), L. Shugg (General Electric Company), Frank B. Ungar (Ludlow-Saylor Wire Company), and E. J. Goes (Koehring Company).

FIRE-RING REMOVAL IN ROTARY KILNS

By W. R. CLIFFE
Hershey, Pennsylvania

JUST as all men have in common the gift of 24 hours in each day, so do all rotary kilns have in common the "fire ring," intended primarily to plague operators. They made their appearance a few days after the "burning in" of the first rotary, and though much has been written concerning their control and removal, they remain a potent malefactor.

As long as the formation can be considered as "coating," the protection afforded the refractory lining is beneficial, but here the good work ends abruptly. From this point until the restricted aperture causes loss of draught control, every stage in the accumulation is detrimental to efficient operation. As the ring approaches the state of complete closure the operator must make a decision, to "burn out" and go off the production line, or to shut down temporarily and try for removal or reduction of the formation.

If he decides on the former course, the feed is usually stopped, then follows a period of four or five hours during which time the charge is rotated from the kiln, that is, all except that which remains impounded behind the fire ring. From the time of feed stoppage until everything that can be drawn off has been removed from the kiln about 20 per cent. of the charge can be considered a usable product.

Ordinarily a minimum of 24 hours is required before men can enter the kiln to attempt slag removal. To do this requires rapid chilling, which regularly adversely affects the brick lining. While the surface of the slag is, at this period, apparently cool enough for men to work it, removal of the first few chunks often exposes a red-hot interior. The work of removing slag under these conditions is brutish and men must work in short shifts. It is not unusual in an old formation to remove as much as 30 tons of slag at such a time, thus 8 to 10 hours is easily consumed in this phase of the shut-down.

After the "fire-up" in the newer installations not many hours are required before the normal quality of production is resumed, but in the older plants several days are often required to regain a state of balance. Here, again, we have the rapid reheating of the lining which, depending on the length of the shut-down and atmospheric conditions, may have taken on surprising quantities of moisture. Under such treatment refractory costs are naturally higher.

A good organization can possibly effect such a cycle as described above in approximately 48 hours. Assume the operating value of the average rotary kiln to be in the neighborhood of $25 per hour, a definite loss of $1,200 is apparent.

Slag formation is such a serious factor in some kilns that shut-downs every 8 to 14 days are considered necessary. Undoubtedly the managements of these units have studied all the known methods of slag removal and consider the full shut-down to be the most economical.

Figure 1. Preparing a small opening in the fire ring to allow release of gas above inner face of kiln lining. Shield prevents hot slag from burning operator.

Figure 2. The CO_2 cartridge with holder in place. Note lead wires.

On the other hand, if the operator (possibly because of pressing need for production) decides on partial slag-formation removal, the kiln is stopped without turning out the feed and a huge water-cooled boring bar is moved forward, the cutting tool adjusted, the kiln rotated, and the desired depth of slag removed. The total loss of time amounts to about 6 hours, but the product is contaminated with fine cuttings from the ring and may not be suitable from a quality standpoint for some hours. This method can only be used where slag forms very close to the discharge end of the kiln.

The operator may elect to use a water poker. Under this method the kiln is stopped and a long pipe is injected into the kiln in the direction of the slag. As many as 12 men are required to handle this unwieldy device. There are products upon which the water from the poker bar has a ruinous effect, and such treatment of the lining is always the same—bad. This method is probably the least effective of any, and the time required is usually 5 or 6 hours. Using this procedure, the fire ring must also be quite close to the firing end of the kiln.

Some operators prefer the cement-kiln gun method for partial slag removal. Even though 5-ounce slugs have been fired from the 8-gage shells, this system also has its limitations which are listed as follows:

(a) Gun and shell cost. It is nothing unusual to fire a thousand shells into a ring; approximate cost, $100.

(b) As slag formation ages it grows longitudinally in the kiln, so that its great mass soon makes the effectiveness of this method questionable. Even though the top or high points are trimmed down, a complete shut-down inevitably occurs.

(c) The shattering effect of the slug on the slag has a tendency to pulverize the material, which in some cases contaminates the kiln charge, thereby considerably reducing its value. Furthermore, if the operator allows the fire ring to build to a great height, when it is removed the charge impounded behind it, when released, flushes forward in uncontrollable quantities. Being of questionable quality, it must often be wasted. Regular trimmings have been found to be the best practice.

A technique which has been under trial bids fair to surmount most of the difficulties associated with the removal of fire rings in rotary kilns, in that (a) the entire procedure does not require over 15 minutes; (b) the slag is broken into large chunks, making re-

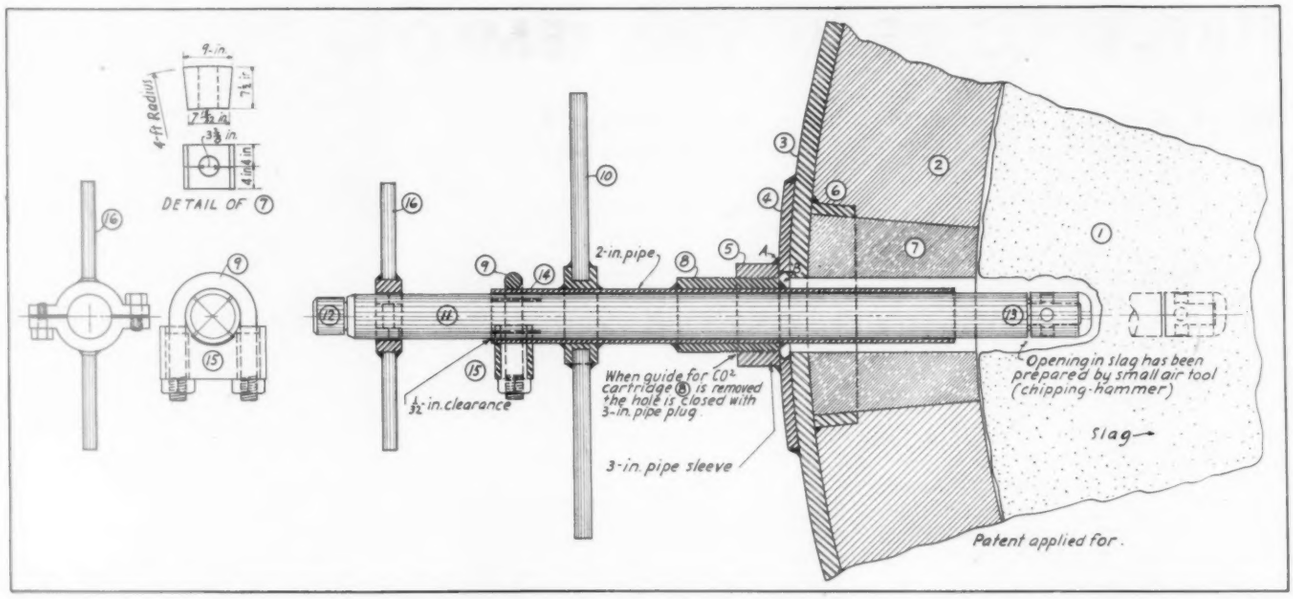

9-in.
4-ft Radius
DETAIL OF (7)
2-in. pipe
When guide for CO² cartridge (8) is removed the hole is closed with 3-in. pipe plug
1/32 in. clearance
3-in. pipe sleeve
Opening in slag has been prepared by small air tool (chipping-hammer)
Slag
Patent applied for

Figure 3. Sketch showing method of inserting the cartridge. (1) Slag formation; (2) refractory lining; (3) kiln shell; (4) Steel plates welded to kiln shell; (5) pipe sleeve; (6) reinforcement welded to inside of kiln; (7) refractory liner core, detail in upper left; (8) cartridge guide; (9) clamp holds cartridge upon release of gas; (10) handle; (11) cartridge; (12) lead wire connection; (13) gas exit ports; (14) contraction slots; (15) clamping device; (16) detachable handle.

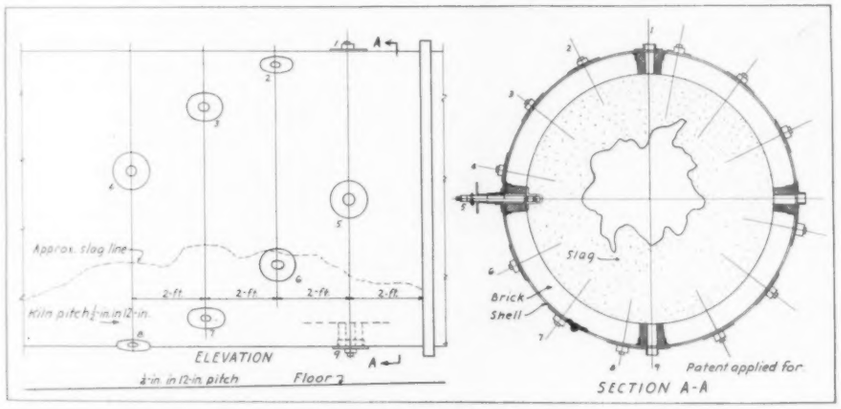


Figure 4. Shell openings to slag formation area.

moval simple; (c) serious contamination of the product is thus avoided; (d) a complete shut-down for slag removal is eliminated; (e) damage to the refractory lining is thus avoided; (f) it is safe; (g) great saving in operating time is effected; (h) considering the decrease in productive time lost and the improvement in products-control ability, the cost is ridiculously small.

Step by step the procedure is as follows:

1. Determine where the slag forms. Provide for a considerable length of operation, as fire rings move up and down the kiln according to changing conditions.

2. Cut with a torch a multiplicity of round openings through the shell of the kiln. (See Figure 1.) Each opening should be ground to a true round to minimize the possibility of tearing the shell plate.

3. Twelve-inch diameter plates, formed to the proper curvature of the kiln shell, are welded about each opening for purpose of reinforcement. (See Figure 2.)

4. Three-inch pipe sleeves with plugs for closures are firmly welded over each opening. (See item 5, Figure 3.)

5. On the inside of the shell weld ½-by 2-inch flat iron on edge at three sides of each opening. This prevents shifting of the bricks. (See item 6, Figure 4.)

6. A small pneumatic chipping hammer is used to dress the radial core out of two matched rotary-kiln liners. (See item 7, Figure 4.)

7. When slag has formed over the openings to a point where it is ready for removal, a small air-tool should be used to dress out the openings for the cartridges. This is a minute's job. Workmen should wear gloves with cuffs to prevent spalls from hot slag from entering their sleeves. In the interest of saving time the proper number of openings should be prepared during this phase of the procedure. (See Figure 4.)

8. Attach the cartridge holding device to the pipe sleeve. (Examine the details of Figure 4 carefully.)

9. Insert the cartridge to which lead wires have been attached. Follow blasting technique. Have the lead wire detached from the battery. The cartridge is placed so as to give the gas-exit ports about 1-inch clearance above the inner face of the fire-brick lining. Experience will indicate the point at which the best results are obtained. (See Figure 4.)

10. Press the battery. The slow expansion of the gas will force the slag loose from the refractory lining in large chunks.

11. Experience will indicate the number of cartridges required for a given condition.

12. Ordinarily, when an organization understands procedure, the total kiln shut-down will amount to about 10 minutes.

The cartridge used in this work is an adaptation of the "Cardox" cartridge, as used extensively in the mining of coal. Both are products of the Cardox Corporation.

The energy medium of the Cardox cartridge is carbon-dioxide gas. A small chemical heating element in the cartridge may be energized at will to cause expansion of the gas up to the pressure value at which release of the gas from the cartridge occurs.

In the application of the Cardox device to rotary kilns the released gas penetrates the natural fissures and cleavage lines, separating the slag from the refractory lining, and breaking it into large chunks which may be removed easily.

Most Producers Look Forward to Good Business this Year

The letters appearing here are in addition to the many received from producers and published in January regarding 1940 business and prospects for 1941.—Editor.

●

ALL indications point to a larger volume of sales for the coming year. There are many large projects now in the "pattern shop" which, of course, will not all materialize. However, the portion materializing, plus our regular "ever-increasing" business, furnishes us with the opinion that for the building trade 1941 will be another banner year.
(Sand and crushed stone—Florida)

●

Our business for the past year has been quite an improvement over former years.

It is a little difficult for us to say what will happen in 1941. If we don't get into war and business continues as it has been going, we should have a very satisfactory year. Our contracts for next year have, with the exception of a couple, all come in and we feel quite satisfied with the outlook.

Everything depends on the course of events in connection with the war. We do not know that our stuff is used particularly in the manufacture of defense equipment, though some of our customers may have had some increase on that account. This appears likely in the insulated-wire and cable companies, where the consumption of our talc has shown a marked increase. But in other lines we are unable to say where our material has been stimulated particularly by the war.

Of course, if anything should happen that peace should be declared or talked of seriously, it would probably result in a decrease in our business.
(Talc—Vermont)

●

Having had a fairly good year in 1940, I anticipate a very nice volume of business in our line during 1941. The Birmingham district naturally depends to a great extent upon the steel industry, together with the coal-mining, clay-products and cast-iron-pipe industries. All these industries are now running at almost full capacity. Sears, Roebuck & Company have just announced the construction of a $1,000,000 building to be started early in 1941, and I firmly believe that there will be a great deal of industrial, warehouse and residential construction during next year.
(Ready-mixed concrete—Alabama)

●

At the conclusion of 1940 it is extremely difficult to make a prediction as to the quantity of business which may develop in 1941 in and around the market which we serve. So much depends on the defense program, and at present so little is known about it. We hear of projects which are proposed for this area, but we have no authoritative information on them, and, of course, the great question of highway building for the handling of mobile military equipment is as yet undecided.

Improvement of business in 1941 over 1940 will most certainly depend upon the number of defense projects undertaken, and it is even possible, if little or no defense work takes place, that the total volume of business in 1941 may be less than that in 1940 due to the probable curtailment of normal public works. I would, however, expect that business would proceed at approximately its present level if defense projects do not develop, and, as I said, if they do, business will improve in proportion to the number and size of such projects.
(Crushed stone—New York)

●

We are carrying over more unfilled contracts this year for delivery in 1941 than for any period since the beginning of the depression. This does not mean, however, that there will be a greater volume of tonnage moving from our plants in 1941 than has normally moved on an average for the past seven or eight years.
(Industrial sand—California)

●

Volume of production in the central Texas area continued very small during 1940. Our tonnage hereabouts was off decidedly more than for the state as a whole. While general business conditions are somewhat improved there has been no demand for heavy commercial or industrial building, and we have had no defense projects or other heavy government construction. Even our highway program has been considerably curtailed.

In addition to the reduced consumption in the area we have suffered appreciably, if not seriously, by reason of the production of finished aggregates on various types of W.P.A. projects by the use of labor furnished by W.P.A. at no cost to the sponsor or the contractor as the case may be.

The prospects for the year 1941 seem somewhat better but it is impossible to evaluate the probable increase in tonnage. Some relatively small public-works projects appear to be approaching the work stage, highways important to national defense promise some activity hereabouts, and it appears not impossible that miscellaneous commercial and industrial building may pick up.
(Sand and Gravel—Texas)

●

We look for business to be very good in all lines manufacturing and distributing construction materials. In fact, we look for business to continue good during the first part of 1942, but all operators should be trimming their sails and watching the trend of events closely during 1942. I hope I am wrong, but am afraid that, when things do slacken, they will go fast, and it behooves everyone to keep his operations well in hand and not get over-extended.
(Crushed stone, ready-mixed concrete—Tennessee)

●

The quarry business for 1940 has been very good. We have had exceptionally large tonnages in blast-furnace flux, open-hearth dolomite and commercial stone. The outlook for the year 1941 appears to be very bright all along the line, and I can see no reason at present why it should not be as good as, or even better than, 1940. Our mills have orders well in advance which will mean a heavy demand for flux and dolomite, and construction work promises to take care of our commercial business.
(Crushed stone—Pennsylvania)

●

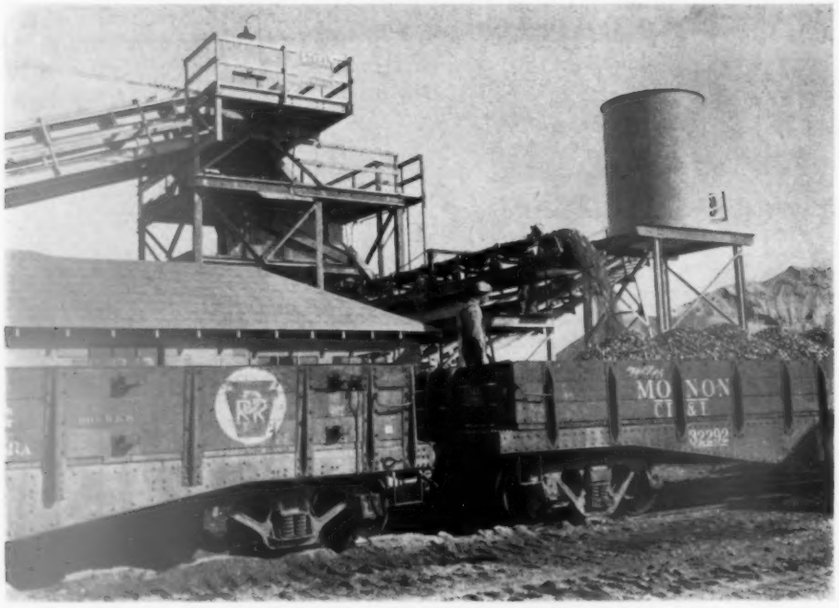
We feel very optimistic and believe that 1941 should show excellent sales possibilities, especially in the building and industrial fields in which we are interested. However, we sometimes wonder whether or not the increased taxes, increased cost of raw materials and additional labor costs may not tend to reduce the possible margin of profit.
(Mineral wool—Indiana)

●

We have on contract orders sufficient business to keep our plant (weather permitting) in full production until July 1. This business consists of government construction and federal-aid projects. The present demand for local building purposes is very high and we hope will continue; if it does it will necessitate operating our plant overtime.

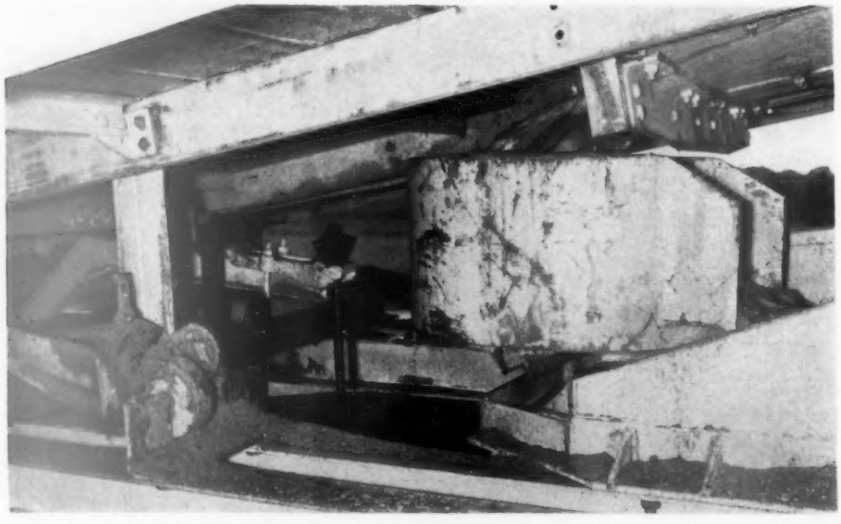
We believe 1941 will be a year of above-normal activity in the construction field; how much will be financed by local capital we are unable to say, but we expect our share of the business.

We do not believe that our position relative to business in 1941 is the exception, but is typical of the industry as a whole in this section of the United States. *(Sand and gravel—Indiana)*



The shuttle belt-conveyor loading gravel into cars. The conveyor from plant and the rinsing screen are at left.

The 15-foot diameter mechanical classifier used for the production of concrete sand.



The tank which makes masons' sand with revolving hopper shown discharging into waste flume.

Dredge at Rock Island plant with new screen-nozzle ladder.

Sump, dewatering elevator, scalping screen, crusher and return conveyor.

The 5- by 10-foot 2-deck screen which makes one size of fine gravel and sand.

Tractor and scraper removing overburden from deposit of Rock Island Sand & Gravel Company.

By W. E. TRAUFFER

Future Specifications Anticipated in Design of This Sand-Gravel Plant

The new plant of the Rock Island Sand & Gravel Company, Rock Island, Illinois, with sump and dewatering elevator at left.

ONE of the best of the new medium-sized sand-and-gravel plants built in recent years is that of the Rock Island Sand & Gravel Company, Rock Island, Illinois, which went into operation in June, 1940. This plant has a capacity of 1,500 tons in 8 hours and is designed and equipped to meet any existing specifications. It is built entirely of concrete and bolted structural steel and provision has been made for future changes and expansion. It was designed by H. J. Larkin, secretary and manager of the company and W. F. Herget, superintendent, and plant details were executed by the Link-Belt Company. To these men this plant represents an ideal long hoped for and finally achieved. Like most of the new plants built in recent years it serves a comparatively small area, about a 30-mile radius by highway and 60 miles by railway.

The Rock Island Sand & Gravel Company was organized in 1902 to deal in sand and other building materials. In 1920 a screening plant was built at Mill Street and Eighth Avenue in Rock Island. Improvements were made to this plant from time to time until late in 1939, when the deposit became depleted. The new plant was then built on an old river-bed deposit near the Rock River 1½ miles west of Milan. There are 75 acres of clean hard material extending to a depth of 20 to 30 feet and with only 2 or 3 feet of overburden. It contains about 40 per cent. gravel, and only 5 to 6 per cent. of the total material is over 2 inches in size and needs to be crushed. There are few bowlders and everything up to 8 inches in size is used.

The overburden is removed by an 8-cubic yard Le Tourneau Carryall scraper drawn by a Caterpillar Diesel tractor. The stripping is kept far ahead of the dredging operations and the overburden is used for fill. In the company's long history many methods of overburden removal have been used from time to time but the present system, according to Mr. Larkin, has been the most economical of all.

The 2- by 3-foot vibrating screen which makes roofing gravel.

The dredge which is used to excavate the deposit is about the only thing brought over from the old plant. An Eagle 35-foot Swintek screen-nozzle ladder with 6- by 8-inch openings feeds the intake line of the 10-inch Amsco Model N manganese-steel dredge pump which is driven by a 250-horsepower General Electric motor. The dredge is held in position by two shore lines and a spud in the center of the dredge hull.

Material is now being pumped through a 700-foot pipe-line to a concrete sump at the plant. An old pump shell lying flat is used at the end of the line to break the force of the flow. Material is excavated from the sump by a 66-foot Link-Belt chain-bucket elevator with 18-inch pitch, ⅜-inch perforated dewatering buckets. From this elevator the material is discharged into a stone box from which it flows over a 4- by 8-foot Tyler Ty-Rock 1-deck screen. Two-inch openings are ordinarily used and the oversize falls into a 30-ton steel tank. When the tank becomes full this material is fed into a Telsmith 8-inch gyratory crusher which reduces it to 2-inch minus. An 18-inch by 30-foot belt-conveyor carries the

The belt-conveyor used for loading out single or blended sizes.

crushed gravel back into the sump forming a closed circuit.

Material passing through the scalping screen is carried on a 24-inch belt-conveyor to a 5- by 10-foot Tyler Ty-Rock 2-deck screen with ¾- and ¼-inch wire cloth and Chain Belt Rex spray nozzles. The ¼- to ¾-inch gravel retained on the bottom deck is usually discharged directly into a concrete silo. It can also be fed to a 2- by 3-foot Simplicity 1-deck screen with ½-inch cloth to remove roofing gravel, which is discharged into an interstice between two silos. In this case the ½- to ¾-inch gravel over the top deck goes into the above silo. The ¾- to 2-inch oversize from the above Ty-Rock screen goes through a chute to a 4- by 8-foot Ty-Rock 2-deck screen with 1½- and 1-inch wire cloth. In this case ¾- to 1-inch "throughs" go into another interstice, and the two coarse-sizes go into individual silos. Often the 1-inch lower

Gasoline tractor and bulldozer used for moving cars at plant.

deck is not used and in such cases the ¾- to 1½-inch gravel goes into the 1- to 1½-inch gravel.

Sand passing through the bottom deck of the 5- by 10-foot Ty-Rock screen passes through a long flume to a 15-foot diameter Link-Belt Rotoscoop which makes concrete sand. No difficulty has been experienced in retaining enough minus 100-mesh sand to meet Federal specifications. In the bottom of this flume are two lifting plate sections under which are ¾- and 3/16-inch perforated plate stationary screens. When masons' sand is desired the plates are lifted and sand passes through the perforations into a rotating feed hopper. Turned one way this feeds the sand into a waste flume; turned the other way it feeds a Link-Belt sand tank. The masons' sand produced is discharged into a silo. If a special product is desired or the run-of-pit material makes it desirable only one of the above plates can be lifted. Ahead of the plates is another gate in the main flume through which all the sand can be

The 4- by 8-foot 2-deck screen which makes three coarse sizes of gravel.

wasted if the concrete-sand bin is full or for other reasons.

Of the five concrete storage silos three have live-loading capacities for three cars of material, one for two cars and the other for four cars. The two interstices hold one carload each. Trucks are loaded through drop chute gates on one side of the silos. On the opposite side near ground-level clam-shell gates feed a loading belt-conveyor in a concrete pit. These gates are so calibrated that any desired percentages of materials can be blended while loading. This 24-inch by 250-foot conveyor is inclined to discharge through a selective hopper either to a 20-inch by 70-foot sand-stock-piling conveyor or on a 24-inch by 30-foot shuttle belt-conveyor for loading cars. If gravel is being loaded, it is washed as it passes over a 3- by 6-foot Simplicity 2-deck screen with ⅜- and ¼-inch openings before going to the shuttle conveyor. If sand or a sand-gravel mix is being loaded, this screen is by-passed.

Near the loading end of the plant there are several truck-loading bins. One set of bins is equipped with weighing batchers for loading the concrete mixer trucks of the Ready Mixed Concrete Company. Cement is dumped into these trucks from sacks at a cement shed. These mixers can also be loaded at the company's yard in downtown Rock Island. A P & H No. 555 gasoline crawler crane with a 1¼-cubic yard Kiesler clam-shell bucket is used to fill

J. C. Larkin; H. J. Larkin, secretary and general manager; W. F. Hergett, superintendent; and L. A. Larkin.

these bins from stock-piles. A Caterpillar 60 gasoline tractor is used to "spot" cars for loading and is equipped with a La Plante-Choate bulldozer for moving stock-piled material, maintaining roadways, etc.

Wash-water for the plant is secured from a worked-out section of the pit. The 8-inch intake pipe for the 8-inch Allis-Chalmers centrifugal water pump extends vertically into the pond for 17 feet through a 24-inch corrugated pipe. In the water system is a 6,000-gallon steel tank which serves to prime the pump and to supply water at all times to the concrete-mixer trucks.

All the plant motors are controlled locally and from a central switchboard in automatic sequence. There are also ground-level circuit shut-offs. If the bucket-elevator stops for any reason, a siren blows and the dredge is stopped.

A modern concrete-block building is used for a warehouse, rest- and change-rooms, etc.

Alemite button-type fittings and Alemite greases are used on all the equipment. The belt-conveyors were supplied complete by the Link-Belt Company. All the steel was supplied by the Rock Island Bridge & Iron Company.

Develops "Elastic" Concrete Sections

When the Swedish building industry resumes operations, it is possible that a new type of concrete section will be obtainable, the Bureau of Mines reports. It is reported that this new product is in the form of "elastic" concrete sections, which may compete with concrete and steel construction. For some years experiments have been made in an attempt to develop this new method of concrete construction, and success was attained by a German engineer about two years ago.

Betangindustri, of Stockholm, has the Swedish manufacturing right, and it has carried out additional experiments at its plant at Hernsberg. In the past few months the new reinforced concrete has been put to practical use, 4,000 meters having been delivered to the office of the High Governor of Stockholm for reinforcing public bomb-proof cellars.

This new type of concrete will reduce the need for beams, and the steel necessary for a given area is only one-twentieth of that used in beams. The method of manufacture consists of stretching on a bench very tough steel wires 2 millimeters in diameter. Later concrete is poured over these, and as soon as the concrete has hardened sufficiently, the tension of the wire is released. Due to the wires' elasticity, they contract and compress the concrete, producing a section of great elasticity.

Welding Saves 141-Foot Dredge

Welding the plates into position. The strap running lengthwise reinforces the butt-welded joint at the junction of the old and new plates.

A large sand-and-gravel company was saved the purchase price of a new dredge recently by the use of Westinghouse arc welders in the reconditioning of hull plates which had been badly corroded by the action of sea air and salt water. The water-line plates of this 141-foot dredge, after many years of service had been eaten away so badly that it had to be removed from service due to the serious leaking which developed. Extensive repairs to its hull, or the purchase of a new dredge seemed to be necessary.

It was decided to attempt the replacement of the corroded plates by use of electric-arc welding. The old plates all around the hull were removed and new sections were welded in their place. The supporting triangle sections for the side runways were cut from the old plates and suspended by temporary braces. The old plates were then cut out, and the new ones, each about 10 feet long by 27 inches wide were welded in place. A butt weld reinforced with a 3- by $\frac{5}{16}$-inch strap was used to join the bottom of the new section to the top of the old. At the top the new plates were welded to the steel deck plates.

The use of welding instead of riveting, which was the method used in the original dredge construction, was well justified by the results. The job was done much quicker and cheaper. Further, had rivets been used considerable additional weight would have been added to the dredge. It is estimated that 2,800 feet of welds was made, and that close to 1,600 pounds of $\frac{5}{32}$- and $\frac{3}{16}$-inch welding rods was consumed. The dredge now is in operation again, and the company has been relieved of the necessity to buy a new dredging unit.

Two of the welders at work on the dredge.

Rotary Lime Kilns Gain Efficiency

By THERON C. TAYLER

IN a previous article I promised to discuss the possibilities of rapid advance in rotary-kiln efficiencies and capacities. It is fortunate that the factors which tend to raise kiln efficiencies tend also to increase capacities and to improve the quality of the product. It may be baffling, but we ought to consider it a happy situation that these factors are so interrelated that an alteration in one upsets many others, for it is this combination that handicaps any piece-meal improvement program and makes a general improvement plan doubly effective.

To succeed we must have a worthwhile objective and a determination to reach it. To save half of the fuel consumed by the average rotary kiln is certainly a good objective. To get double the output with no increase in fuel is a very desirable objective. To get doubled output, doubled efficiency and, on top of this, improved quality is an objective worthy of much effort and determination.

Starting with the average rotary kiln of 25-per cent. thermal efficiency—about 3 pounds of lime per pound of coal—we may choose to set our goal as an attempt to double the efficiency, or we may aim high, for 100-per cent. efficiency. The first is too easy; it lies within a range of results which can be guaranteed. The second is obviously far beyond anything practical. I feel that the immediate goal should be 75-per cent. efficiency and one might be entitled to feel quite satisfied even if the first accomplishment fell somewhat short of such a goal, as long as it presented a new record in attainment.

Too many seem to think that rotary-kiln efficiencies must remain low. There is an all-too-prevalent idea that the gases must pass to the stack at 1,000 degrees to 1,400 degrees F. There are others who to-day are overly enthusiastic over the possibilities of stone preheaters as such. As a preheater patentee I harbor no magical conception of their possibilities. I will have much more to say on this phase in subsequent articles.

If we are to improve kiln operations the most logical starting point from which to plan a course of action is to make a study of the losses. With 75 per cent. of the heat of the fuel being wasted, we have some sizable losses to consider. If we can stop two-thirds of those losses we will attain our goal of 75-per cent. efficiency or about 8 pounds of lime produced per pound of fuel burned.

The losses are of two kinds, direct and indirect. Let us first list the direct losses in the order of their importance as follows:

1. Stack loss—the sensible heat in the gases above the temperature of the entering air and fuel.

2. Radiation and convection from outside surfaces of kiln, cooler and equipment.

3. Lime loss—the sensible heat in the lime leaving the cooler above the tem-

(Continued on page 59)

State Legislatures Consider Various Laws Affecting Minerals Industries

COINCIDENT with convening of the Seventy-Seventh Congress at Washington, law-makers in 42 of the nation's 48 states met last month. In many states they will enact measures as vital to the mineral industries as many of the law-makers at Washington will provide for the safety and welfare of the country.

In the state law-making bodies steps will be taken to cure ills, actual and alleged, in the administration of workmen's compensation statutes; to provide further protection to workers against silicosis and other hazards; to make available sand deposits below state-controlled rivers and lakes; to restrict certain deposits for government use; and to regulate the sale and use of explosives.

And there will be more general measures occupying the attention of state legislators, some none-the-less important to operators, including wage-hour and labor-relations bills, unemployment-insurance programs, sales and transaction tax measures, to mention but a few.

Legislative sessions that opened last month are the first regular meetings of state law makers in two years in 36 of the 42 states. Six states—Arizona. Massachusetts, New Jersey, New York, Rhode Island and South Carolina—have legislative sessions every January. No regular session will be held this year in Kentucky, Louisiana, Mississippi and Virginia, where legislators meet biennially in even-numbered years, and in Alabama, where law makers meet every four years and will hold their next regular session in 1943.

Many states place a limit on the length of their legislative sessions, often 60 days, while others will carry on the business of law-making well into the summer months.

Several states enacted minimum-wage and maximum-hour laws during 1939 legislative sessions, extending provisions of the national wage-hour act to firms doing business strictly within the borders of a state. Recent weeks have seen considerable discussion on waiving the hour provisions of the national act in the interest of national defense, but Secretary of Labor Frances Perkins and Federal Wage and Hour Administrator Philip F. Fleming have both voiced strong opposition to proposed relaxing of present wage-and-hour standards.

The national defense argument raised by those who would lower hour standards for firms engaged in interstate commerce could not be made to apply to firms operating wholly within a state, and last month it appeared unlikely that any concerted drive would be made to repeal existing state wage-hour laws. Moreover, it appeared that labor lobbies would be successful in gaining enactment of this legislation in additional states, where law-makers two years ago refused favorable action with the thought that constitutionality of the national act might not be upheld.

One of four "model" laws to be submitted to all state legislatures by the Federal-State Conference on Law Enforcement Problems in National Defense will directly affect the mineral industries. It seeks to regulate the manufacture, sale, distribution, use and possession of explosives, and license those who use explosives. It would require manufacturers and dealers to submit periodic reports revealing the amounts of explosives sold and the names of the purchasers to provide a central point of information on the location and quantities of explosives and would license persons manufacturing explosives. The measure is designed to supplement existing state laws covering safe handling and shipping of explosives in normal commercial applications.

Most states will be asked to provide legislation guaranteeing reinstatement in civil positions of persons returning to civilian life after serving under the National Selective Service Act. The legislation, which would supplement present federal law, would enable a returning soldier whose employer refused to rehire him to take his case into state courts through the district attorney's office without charge.

After taking several days for organization in most states, law makers, up to the time PIT AND QUARRY went to press, had introduced but a few of the thousands of measures that will receive study during the coming months. Those brought forward, however, indicated the trend of this legislative year.

Important state action affecting the industry, up to late January, included:

Arizona—Governor Sidney P. Osborn called for legislation providing compensation to workmen suffering from occuptional disease, and specifically mentioned silicosis. "Disability due to occupational disease is just as disastrous to the laboring man and woman as disability from any other cause," the governor told the legislature. "Since our workmen's compensation law is designed to protect those injured in industry, it should provide relief also in cases of disability arising from occupational disease. In keeping with our platform pledge, I recommend that you enact a measure that will provide just compensation for disability due to silicosis."

The governor also urged "enlargement of the functions of the state resources board, so that it may become an active, fact-finding, service agency that will supply potential industries with the information and help needed to establish them here."

A Senate bill would prohibit, without a bill of sale, any machinery used in mining operations. A House bill would place a privilege tax of 2 per cent. on all business.

Arkansas—Governor Homer M. Adkins told the legislature to take every possible step toward development of the state's natural resources.

A Senate bill would levy a severance tax of $10 a ton on bauxite. The present tax is 2.5 per cent. of the actual market value at the point of severance.

A House bill would levy a $50 annual license fee on itinerant merchants who travel with trucks or automobiles, require them to post a $500 bond to guarantee payment of any legal license fees, and a $1,000 bond to protect the public against fraud and to pay judgments obtained for civil liability arising out of the conduct of their business.

Legislative recommendations of State Labor Commissioner Ed I. McKinley, Sr. included a state wage-hour law and a labor-relations law similar to the federal acts.

California—A state wage-hour bill and a state labor-relations measure, both failing of passage during the 1939 legislature, even with administration backing, are being pushed for passage again this year.

Idaho—Legislators are looking toward a sales tax to raise $2,500,000 additional revenue for the next two years, requested by Governor Chase A. Clark.

Indiana—Several proposals seeking to lower the present 1- per cent. tax on gross receipts are before the legislature. A move to cut the tax to one-half of one

By Z. H. MISCHKA

per cent. appears to have the greatest support.

Governor Henry F. Stricker, addressing the legislature, asked that "thoughtful consideration be given to labor's plea for a state wage-and-hour law, liberalization of workmen's compensation laws, and such other measures as will improve labor's position in Indiana." The State Industrial Council of the C.I.O. and Labor's Non-Partisan League have opened headquarters in an Indianapolis hotel with a staff of 15 registered lobbyists to aid in obtaining favorable labor legislation.

Kansas—Governor Payne Ratner, addressing the legislature, presented a brief for home-owned business: "Our Kansas economy includes a great diversity of effort in the fields of agriculture, industry, the professions and business. In this vast pattern of endeavor, contributing to the prosperity of the state as a whole, is a large group of merchants paying taxes and otherwise contributing to the advancement of Kansas. Our home-owned businesses and industries deserve proper encouragement. The elimination of unfair competition and discrimination, and the prevention of destructive practices of merchandising that are injurious to consumers and independent businessmen, are practical methods of offering such encouragement. I suggest your careful consideration of these important problems."

Maine—A bill seeking to limit the hours of labor to 48 in any one week was carried over from the 1939 session, and referred to the Senate's committee on labor.

Michigan—Governor Murray D. Van Waggoner, addressing the legislature, said: "To give all workers the protection they are entitled to under modern trying and often hazardous industrial conditions, I recommend that the scope of the 1937 Occuptional Disease law be extended." The governor did not enlarge on that statement, but added in another part of his address that "benefits of progressive labor legislation should be made available to all Michigan workers, and not only to those who are engaged in interstate commerce. A wages-and-hours act adapted to Michigan conditions should be made available to all Michigan workers," he added.

Montana—Governor Sam C. Ford termed silicosis "one of the problems that has long confronted us," when addressing the legislature. "The problem would appear to be national in scope and a solution can only be found in coöperation between the federal government and the states," he said. "A bill for this purpose was passed by the twenty-sixth legislative assembly, but vetoed. I hope a similar measure will be enacted at this session."

New Mexico—Bills certain to cause considerable controversy this session are wage-hour and labor-relations measures. The legislature will, for the first time, operate under a split-session plan, devoting 30 days to the introduction of bills, followed by a 30-day recess, with another 30 days for passing or rejecting measures.

North Carolina—Governor Joseph Melville Broughton, addressing the legislature, called for continuation of a "remarkably harmonious" relationship between capital and labor. "Under authority of an act of the last general assembly, a commission of eminent citizens was appointed to study wage-and-hour legislation," he said. "The report of that commission will be made to this session of the general assembly, and I urge the most careful consideration of this report."

South Dakota— Governor Harlan J. Bushfield, addressing the legislature, called attention to a $25,000 appropriation made by the last legislature for a survey of mineral resources, and asked a similar amount for "a continuation of this survey during the ensuing two years."

Texas—Governor W. Lee O'Daniel asked for a 1.6-per cent. transaction tax which would apply to natural-resource producers. A similar proposal asked by the governor two years ago was rejected by the legislature.

Measures prepared for introduction included one to alter the state unemployment-compensation statute to conform further to federal statutes and make possible a saving of possibly $10,000,000 annually to employers, and another to provide a state wage-hour law.

Utah—The State Federation of Labor has announced intention to seek a state wage-hour statute patterned after the federal law.

Vermont—Liberalization of the state workmen's compensation act by increasing the minimum average weekly wage in death benefit cases from $5 to $14, amending provisions for payment of medical and hospital benefits, and extending coverage to illegally employed minors, was recommended by Commissioner of Industrial Relations Howard E. Armstrong.

Wyoming—Governor Nels Smith, addressing the legislature, called attention to a survey in progress to obtain all the available information on the state's natural resources, declaring that the data gathered will be made available to private industry.

A state wage-hour bill, identical to one which failed of passage two years ago, has been prepared for introduction this session.

Tayler *(from page 57)*

perature of the entering stone.

4. Incomplete combustion—fuel unburned or only partly burned.

The indirect losses contribute to the direct losses and are of much greater importance than generally considered. The chief of them are:

1. The use of high-level heat for low-level work—gases above the calcination temperature to heat stone which is below the calcination temperature.

2. Evaporation of water in the stone.

Both these indirect losses contribute to the stack loss listed as the largest and most important direct loss. The stack loss amounts to 50 per cent. of the heat of the fuel. We must save a large part of this if we are going to reach our goal. In subsequent papers I shall discuss this in detail.

In papers presented a few months ago radiation and convection losses were placed at 16 per cent., at least half of which was easily recoverable. When we properly dispose of stack and other losses, insulation in the rear half of the kiln will come to have value and make it possible for us to increase the saving from this source.

The loss in heat caused by allowing the lime to leave the cooler while it is hot, or by wasting the heated air used for cooling the lime, amounts to about 8 per cent. It is of great importance that this loss be reduced to a negligible amount, because any waste of such heat is not only a loss of itself but it also has a large indirect effect upon the stack loss.

Incomplete combustion is usually a loss of little importance and one rather easily reduced, if appreciable.

Getting more efficiency and capacity from a rotary kiln requires a study of heat balances. It is a matter of good engineering. Engineering is a basic science dealing with facts rather than fantasies. If we confine ourselves to plain clear thinking, the path to higher efficiency and capacity will open to us.

It is not good engineering when someone builds a monstrosity. We have seen lime kilns so long that if cut in two or three pieces they would double or triple the plant output. We have seen kilns built large in diameter with no apparent regard for the fact that radiant-heat intensity varies inversely as the square of the distance. The doctor may bury his mistake, but let an engineer make a mistake and he finds that he has erected a monument to his folly.

PERSONAL MENTION

S. C. Hadden, for several years secretary of the Indiana Mineral Aggregates Association, Indianapolis, has resigned to become a member of the Indiana Highway Commission. His successor has not as yet been named.

Harry S. Davison, of J. K. Davison & Brother, Pittsburgh, who recently recently went to the hospital with a bad cold and an injured leg, is recuperating in Florida.

Henry M. Hale, eastern sales manager of the Caterpillar Tractor Company, has announced his resignation from that office to enter into partnership with John R. Taylor as the Taylor-Hale Machinery Company of Memphis, Tennessee. From its headquarters in Memphis, the newly formed company will handle sales and service of Caterpillar products in an extensive southern area.

W. M. Stoner of Lincoln, Nebraska, president of the Western Sand & Gravel Company of Lincoln, Nebraska, and A. K. Frolich, official of the Ash Grove Lime & Portland Cement Company of Louisville, Nebraska, were elected to the board of directors of the Associated Industries of Nebraska at the recent annual meeting in Lincoln.

Horace E. Thorn has been appointed manager of the Philadelphia branch office of the John A. Roebling's Sons Company, while W. K. Hanna has been named manager of the Pittsburgh territory.

Fred W. Crocker, formerly chief designing engineer of the Permanente Corporation during the construction of the plant near Los Altos in 1939, has become chief engineer of the Todd-California Shipbuilding Corporation, Richmond, California.

Miles D. Caton, development engineer with the Portland Cement Association for many years and recently closely connected with the association's promotion of soil-cement roads, has been named head of the newly-formed Soil-Cement Bureau at association headquarters in Chicago.

J. F. Kaufman has been made chief engineer of the Ideal Cement Company with supervision of all plants owned and controlled by that concern. He is making his headquarters at the general offices in Denver. Mr. Kaufman formerly was superintendent at the Okay, Arkansas plant where he has been succeeded by Paul Hensley. Mr. Hensley formerly was assistant superintendent at the plant in Ada, Oklahoma.

Robert W. Downes has been named director of sales of the National Gypsum Company. He has been an employee of the company since its original incorporation 15 years ago, serving as sales representative, district sales manager, and divisional sales manager before assuming his present responsibilities.

Dr. John V. Dorr, president of the Dorr Company, Inc., has been awarded the Perkins Medal, highest award in the chemical profession, by the Society of the Chemical Industry.

Edward Kilpatrick of the Edison Cement Corporation was reëlected a trustee of the New Jersey Highway Users Conference at its recent annual meeting. The group took a strong stand against highway fund diversion.

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THE NEW G-8 PACIFIC Gas-Driven ROCK BIT GRINDER

QUICKLY restores proper cutting edge and gauge on 4-way detachable rock bits up to 3" diameter, anywhere and anytime.

The new Model G-8 unit includes double wheel, ball bearing, grinding head and two 8"x1¼" wheels, fully guarded; Powered with standard 4-cycle gasoline engine equipped with air cleaner and flyball type centrifugal governor; Right wheel equipped with PACIFIC attachments is for bit grinding; Left wheel for general utility grinding, sharpening pick points, etc. Attractively priced.

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With this new economy unit and a few bits you're set for handling small rock drilling jobs . . . PACIFIC G-8 rock bit grinder is gas-driven with plenty of power for the job . . . No special rigging needed to install this portable, self-contained outfit.

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CHARLES J. O'BRIEN, formerly service and sales engineer with the Blaw-Knox Company in the eastern part of the United States, is now a member of the sales organization of Giles & Ransome, equipment dealers, Philadelphia.

B. B. WILLIAMS has resigned as president of the Cooper-Bessemer Corporation, and CHARLES B. JAHNKE was chosen as his successor, following a meeting of the corporation's board of directors in Mount Vernon, Ohio, recently. Mr. Williams was made chairman of the board of directors.

D. S. MIX has been named to direct media and publishers' relations, of the General Electric publicity department, Schenectady, according to an announcement by R. S. PEARE, manager of G-E's Publicity Department and Broadcasting. Under his new duties, Mr. Mix will have responsibility for the work formerly handled by the late F. R. Davis. He has been with the company since 1917.

R. W. MARTIN of the Forrer Stone & Supply Company, Madison, Wisconsin, has been elected secretary of the West Side Business Men's club in that city.

ALFRED S. OTTON has been made advertising manager of the Robins Conveying Belt Company. He has been associated with the company since 1937, having formerly been in charge of screen-cloth sales.

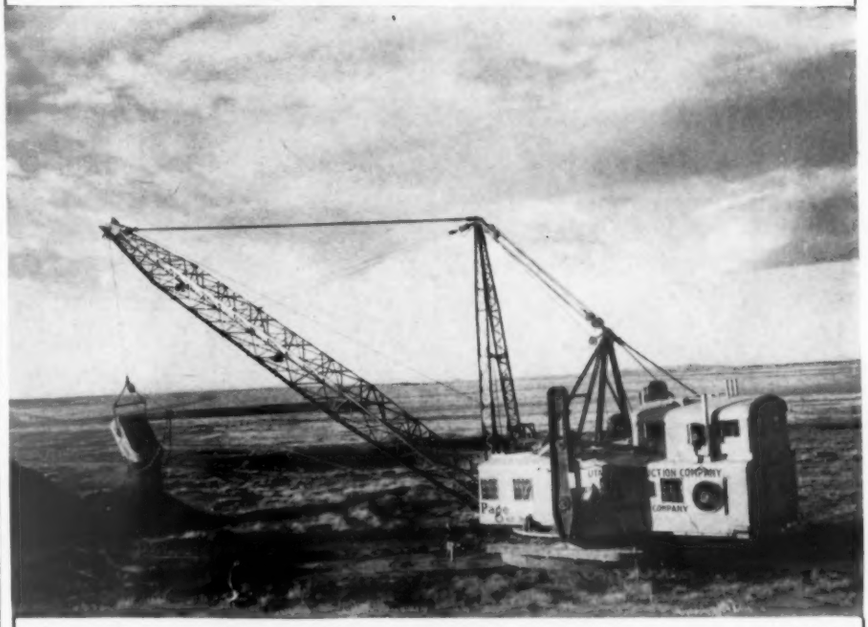
DR. EDWARD BARTOW has been granted a year's leave of absence from the University of Iowa, where he is professor emeritus of chemistry and chemical engineering, and will do special work in the research laboratories of the Johns-Manville Corporation.

DANIEL O. MORAN, for 20 years owner and operator of the Moran Sand & Gravel Company, died at his home in Oil City, Pennsylvania on January 1 at the age of 96. He was an organizer of the Oil City Chamber of Commerce and had long been active in civic affairs.

FRANK WELSCH, 46, a representative of the Huron Portland Cement Company, sustained painful injuries and WALTER WINDING, member of the Winding & Slauson Construction Company, Wauwatosa, Wisconsin, was killed recently when their automobile was crushed by a load of pulp logs spilled from a skidding truck on a highway near Stevens Point, Wisconsin.

PAGE TWO-ENGINE DIESEL-POWERED WALKING DRAGLINE

One engine for loading and hoisting
Another separate engine for swinging



On canal work near Tucumcari, New Mexico, Utah Construction Company and Griffith Company use this Page Walker, powered by two Page horizontal Diesels, one mounted above the other. A heavy-duty 6½-cubic-yard Page Bucket is used on a 110-foot boom.

Here is a new development in large draglines—fast hoist and fast swing at the same time! No longer need the operator delay the swing of the machine waiting for the hoisting of the bucket. Rather, with the balanced power of the Page Two-Engine Walker, acceleration of hoisting and swinging is greatly increased.

To understand this faster operation with a Page Two-Engine Walker, visualize using all of the power of your present dragline for hoisting only, without swinging the machine. You will find that the hoisting speed will be increased greatly. Now consider a second independent engine for swinging only. This second engine accelerates the swing in proportion to the faster hoist. The two engines—the large Diesel, which only hoists and loads the bucket, and the smaller independent Diesel for swinging as rapidly as the faster hoist demands—furnish perfectly balanced power and increase the number of loaded buckets that can be handled per minute. Learn what a Page Two-Engine Walker will do on your dragline job.

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Page Automatic Dragline Buckets · Page Walking Dragline Machines
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WITH A ***FIST GRIP*** ... NOT A

ROPE CRIMPING "FINGER-PINCH"

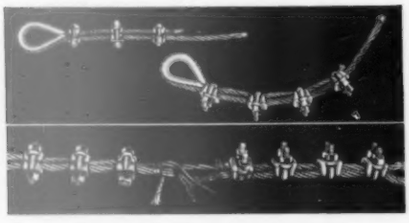
Laughlin drop forged Safety Clips *grip* around wire rope like a *fist* — the rope stays straight — uncrimped — can be used again when the clips are removed.

None of the narrow "finger-pinching" you get with ordinary U-Bolt clips which bow the wire — crimp it — and eventually break it.

Write for free booklet describing tests illustrated below. It will show you how to save on both rope and clips. Use handy coupon below and mail it today!

YOU NEED FEWER CLIPS

Use 3 Laughlin Safety Clips instead of 4 U-Bolt clips — get the same strength.



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Portland, Maine

Send me free Safety Clip booklet. Q-2

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Company .....

Address .....

Check here for catalog on items below ☐

Look for Laughlin products in Fit & Quarry Handbook and buy through your distributor.

CLAUDE L. MCLAUGLIN, 43, an employee of the Dewey Portland Cement Company near Davenport, Iowa was killed recently when he fell into the whirling blades of a separator. Press reports indicate a trap door had been left open to cool the mill preparatory to a change of fan blades and the victim apparently failed to notice the opening while making his rounds as an oiler.

JOHN CALLAN, 74, son of one of the pioneer lime-quarry operators in Ontario, died recently in the General Hospital, Woodstock, Ontario.

MILTON C. LININGER, of the sand-and-gravel firm of M. C. Lininger & Son, Ashland, Oregon, died recently.

P.C.A. Report on Building Materials Now Available

Tests made at the National Bureau of Standards, Department of Commerce, on six floor specimens submitted by the Portland Cement Association are described in a new "Building Materials and Structures" report just issued by the Bureau. The specimens represented a precast joint concrete floor construction.

Transverse, impact, and concentrated loads were applied, simulating the loads to which the floor of a house would be subjected in actual service. For each of the loads three like specimens were tested. The deformation under load and the set after the load was removed were measured for each increment of load. The results are presented in graphs and in a table. Copies of the report, issued as BMS62, are obtainable at 10 cents each from the Superintendent of Documents, Government Printing Office, Washington, D. C.

LABOR DECISIONS

Contract

Triboro Coach Corporation v. New York State Labor Relations Board et al., decided by the New York Supreme Court, Special Term, Queens County, September 21, 1940; reported at 22 N.Y.S. (2d) 1013.

A collective-bargaining agreement between the employer involved in this case and a union designated as the "Amalgamated" ran for a period of three years and continued automatically for successive periods of three years unless either party was formally notified by the other. It became effective on October 20, 1936. On November 14, 1939, a new contract, more favorable to the employees, was put to a vote of the employees and was approved by a majority vote. At about the same time there were proceedings before the State Labor Relations Board pursuant to which an election was held on November 24, 1939, to determine the representative desired by the employees, and the Amalgamated union lost to another designated as "Transport." The board thereafter ordered the company to cease giving effect to its contracts with "Amalgamated" and to bargain collectively with "Transport."

In this action before the Supreme Court the employer and "Amalgamated" won a decision setting aside the order of the board and its earlier proceedings certifying "Transport" as the employees' representative for collective bargaining. The court recalls that the purpose of the State Labor Relations Act (Article 20 of the Labor Law) is to protect the right of employees to organize "free from the interference, restraint or coercion of their employers" and to bargain collectively. "Any agreement procured as the result of an unfair labor practice, as defined by the act, or because of any employer domination or interference, restraint or coercion, whether by way of a company union, a labor organization, or otherwise, is in direct conflict with this public policy. On the other hand, an agreement obtained for the benefit of employees by their own *bona fide* labor organization, whom they have selected as their representative by joining and retaining their membership therein, is binding upon them in the absence of any interference or unfair labor practices on the part of their employer. Such agreement may not be disregarded or set aside during its life merely because of the activity of a rival labor organization actively seeking control by way of a certificate of representation."

"I can not conceive it to have been the intent of the legislature," says the justice rendering the decision, "to permit employees, where a valid existing contract is involved and under the circumstances presented here, to substitute one bargaining agency for another whenever it suits their purpose, or the purpose of a rival labor organization, during the life of that contract. If employees are to enjoy actual liberty of contract through their labor organizations or other *bona fide* representatives, and their contracts are to be effective, their obligations may not be repudiated simply by the process of changing representatives, and in their own interest they should not seek to do so."

Work-Relief Payments

Republic Steel Corporation v. National Labor Relations Board et al., decided by the United States Supreme Court, November 12, 1940; reported at 61 S. Ct. 77.

This case reached the Supreme Court as a review of a decision of the Circuit Court of Appeals, 107 Fed. (2d) 472, but the review was limited to the single question whether the board had authority, in providing for back pay, to direct the employer to deduct from the payments to the reinstated employees the amounts they had received for work performed upon "work-relief projects" and to pay over such amounts to the appropriate governmental agencies. Review was granted because the decision of the Third Circuit Court of Appeals upholding the board's right to make such requirements was in conflict with decisions in other circuits in *National Labor Relations Board v. Leviton Manufacturing Company*, 111 Fed. (2d) 619, and *National Labor Relations Board v. Tovrea Packing Company*, 111 Fed. (2d) 626.

The Supreme Court rules that the National Labor Relations Act is essentially remedial, but that the payments concerned, as conceived by the board, are in the nature of penalties. "It is not enough to justify the board's requirements to say that they would have the effect of deterring persons from violating the act. That argument proves too much, for if such a deterrent effect is sufficient to sustain an order of the board, it would be free to set up any system of penalties which it would deem adequate to that end." The court accordingly holds that the provision requiring the payments to governmental agencies was beyond the board's authority, and the order of the appeals court is modified to that extent.

Change in Agent

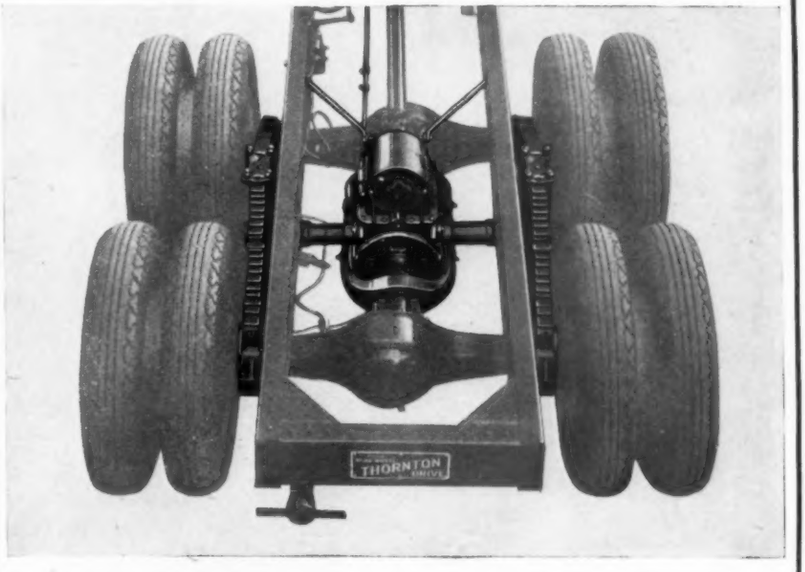
International Association of Machinists, Tool and Die Makers Lodge No. 35 v. National Labor Relations Board, decided by the United States Supreme Court, November 12, 1940; reported at 61 S. Ct. 83.

The National Labor Relations Board ordered the employer involved in this case to abrogate a closed-shop contract with an A.F. of L. union covering its tool-room employees and (among other things) to deal with a C.I.O. union, an industrial unit. The A.F. of L. union filed a petition for review, the Circuit Court of Appeals affirmed the board's order, and the case was taken to the Surpreme Court.

The court had two questions for decision: (1) whether on the facts of this case the board had authority to find that an industrial unit was appropriate for collective-bargaining purposes to the exclusion of a craft unit, and (2) whether the board had authority to require the employer to bargain with that industrial unit, despite a claim submitted to the board by the craft unit before the order issued that the craft unit then had been designated by a majority of all the employees.

(1) On a review of the facts, the court finds that the employer, while evincing great hostility to the C.I.O. union in a contest to enlist its production force, acquiesced without protest in the organization of the tool-room employees by the A.F. of L. union, and that the presence of unfair labor practices in this case "justified the board's conclusion that petitioner" (the A.F. of L union) "did not represent an uncoerced majority of the tool-room employees." That conclusion made it unnecessary to pass upon the scope of the board's power to determine the appropriate bargaining unit.

(2) The A.F. of L. union challenged the order directing the employer to bargain exclusively with the C.I.O. unit, on the ground that before the issuance of the order the A.F. of L. union had obtained an overwhelming majority of the production employees and had so notified the board. The Supreme Court



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Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL which gives traction when slippery going makes trucks equipped with ordinary differentials helpless.

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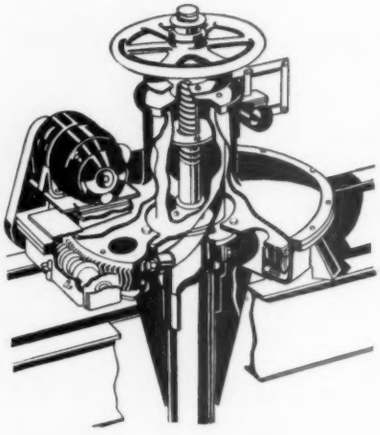
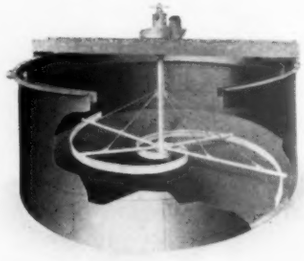
agrees with the Circuit Court of Appeals that the board did not commit error in failing to act on the request for an election or investigation. "Where as a result of unfair labor practices a union can not be said to represent an uncoerced majority, the board has the power to take appropriate steps to the end that the effect of those practices will be dissipated. . . . It can not be assumed that an unremedied refusal of an employer to bargain collectively with an appropriate bargaining organization has no effect on the development of collective bargaining. . . . Nor is the conclusion unjustified that unless the effect of the unfair labor practices is completely dissipated, the employees might still be subject to improper restraints and not have the complete freedom of choice which the act contemplates. Hence the failure of the board to recognize the petitioner's notice of change was wholly proper." The decision of the court below is affirmed.

The court further points out that Section 9 of the act provides adequate machinery for determining in certification proceedings questions of representation after unfair labor practices have been removed as obstacles to the employees' full freedom of choice.

"AUTO RAISE"
THICKENER





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Vermiculite Sales Establish Record

Sales of vermiculite during the last year made an all-time record but no deposits comparable to those in Montana have yet been found elsewhere and, consequently, one company furnishes well over 90 per cent. of total shipments, the Bureau of Mines reports. The various Colorado mines were inactive in 1940, but there were four operators in North Carolina and two or three in Wyoming. Expanding plants, most of them licensed under the Zonolite patents, are well distributed throughout the country, in Canada and several other countries. Raw material suitably sized for making house fill is priced at $12 a short ton, Libby, Montana, plus freight, which ranges from a minimum of $6.60 to Minneapolis, to $16.50 to Boston; to New York and also to Montreal the freight rate is $13, and an $11 rate applies to a broad belt reaching from Toronto, southward through Ohio, to Louisiana and Texas.

Approximately 60 per cent. of the consumption of vermiculite today is for house fill, which calls chiefly for raw material sized minus 3 plus 14-mesh. The fastest growing use is in concrete, chiefly as a 1:8 mix with Portland cement. This may be poured in place or precast into light-weight, fire-proof slabs for partition walls, floors, and roofs. There is a possibility that enormous quantities of vermiculite concrete may be used to sound-deaden airplane-engine testing sheds. Acoustical plasters carrying 3 parts gypsum to 1 part vermiculite also have become an important outlet, using either minus 10-plus 20-mesh or minus 16-plus 24-mesh raw material. A whole series of lightweight and refractory products is being manufactured.

OCCUPATIONAL DISEASES AND THE LAW

Injury to Lungs

Traders & General Insurance Company v. Wright, decided by the Court of Civil Appeals of Texas, Eastland, October 11, 1940, rehearing denied November 8, 1940; reported at 144 S. W. (2d) 626.

The workman involved in this case obtained a judgment under the Texas Workmen's Compensation Act, which the employer's insurance carrier sought to have set aside. The Court, however, affirms the award, holding that the evidence is sufficient to authorize a find-

ing that the workman, while cleaning out an oil tank, inhaled poisonous gas under such circumstances as to constitute an accidental injury within the meaning of Article 8309, Vernon's Annotated Civil Statutes of Texas, and that the inhalation of the gas so injured his lungs that as a result thereof he thereafter contracted, in succession, pneumonia and tuberculosis, and that the injury was a contributing cause of his incapacity.

An alternative plea in the plaintiff's suit, that by reason of the gas entering his lungs, latent and dormant tubercular bacilli were made active and as a natural result thereof tuberculosis developed, is held not to be proof (as claimed by the defendant) that the incapacity was a result of a tubercular condition which existed before the inhalation of gas.

Under the Texas law, diseases which result from an injury are themselves classed as an injury, and if an employee is incapacitated thereby, or if he dies therefrom, compensation is allowed *(Texas Employers' Insurance Association v. Burnett,* 105 S. W. (2d) 200, 201). The Court holds that in this case "the injury to plaintiff's lungs was the cause which operated continuously through a sequence of events, each flowing naturally from the other (burned and irritated lungs — pneumonia — tuberculosis), and eventuating in plaintiff's disability."

Respirator

Blittschau v. American Car & Foundry Company, decided by the St. Louis (Missouri) Court of Appeals, November 8, 1940; reported at 144 S. W. (2d) 196.

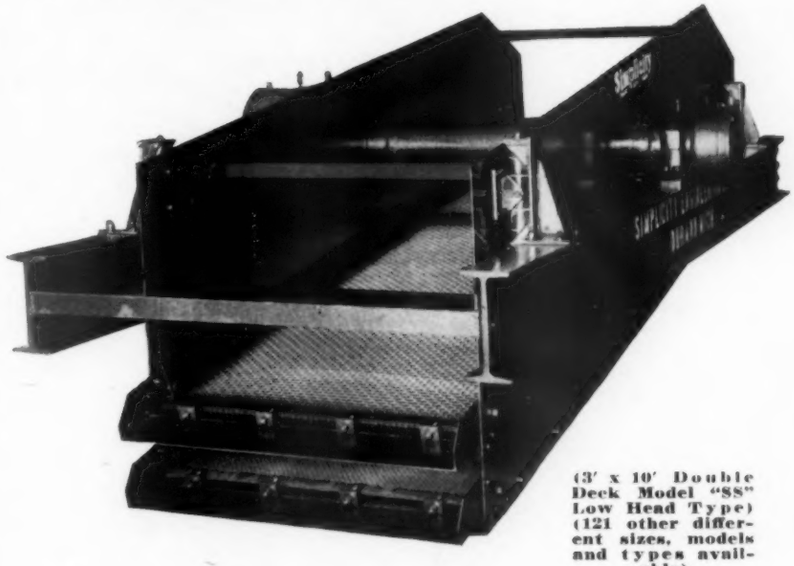
Sec. 13254 of the Revised Statutes of Missouri, 1929, as expressly construed by the Missouri Supreme Court (*Boll v. Condie-Bray Glass & Paint Company,* 231 Mo. 92, 11 S. W. (2d) 48, 51), mandatorily requires that "adequate and approved respirators shall be furnished and maintained by the employer," and in so providing leaves no room for discretion on the part of the employer in the manner of complying with the statute. Where (as in this case) there is evidence that the work or process carried on is "productive of noxious or poisonous dusts," it is no part of the duty of the plaintiff (says the Court) to offer evidence that respirators were practicable, feasible or possible, or that the employer had them at hand, or could have procured them at reasonable expense. The plaintiff. instead, has merely the burden of introducing evidence that the employer had violated the statute, resulting in the injury complained of.

This ruling is made in this case because the plaintiff, who sued for dam-

GYRATING SCREENS

SIMPLICITY

THE KEY
TO SUPERIOR RESULTS
IN SCREENING OPERATIONS



(3' x 10' Double Deck Model "88" Low Head Type) (121 other different sizes, models and types available)

Let Simplicity Gyrating Screens be the key to better screening and larger profits in 1941. They are the result of sound engineering combined with years of experience since the first Simplicity Screen was built in 1922. Simplicity Screens will operate right because they are built right.

Note these salient factors in establishing superiority of Simplicity Gyrating Screens:

(a) A solid counter-balanced eccentric shaft assures positive screening action and smooth operation.

(b) Opposed type rubber corner supports eliminate excessive structural wear and stop vibration from reaching the frame work.

(c) Screen cloth has four-way tension, preventing cloth sag and wire whip. Use of lighter and stronger wire increases capacity and eliminates blinding.

(d) Dust sealed high-grade anti-friction bearings carry gyrating assembly. Alemite lubricated.

(e) Extra rugged, all steel construction insures durability and minimum repairs.

SIMPLICITY CAN MAKE ANY GOOD YEAR BETTER!

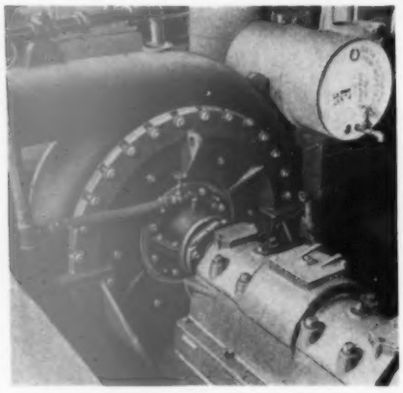
SIMPLICITY ENGINEERING COMPANY
DURAND, MICHIGAN

The MORRIS HYDRAULIC COLUMN

News of interest to Centrifugal Pump Users

Dredges that reduce production costs . . . . . .

The long list of Morris sand and gravel dredge records is full of examples of speedy, economical and trouble-free service, such as twice the expected sand and gravel production, hundreds of thousands of cubic yards of heavy material without repair expense, greater capacity and dredging depth than obtainable with other equipment, etc. Morris Dredges are furnished for any kind of dredging work and for any operating conditions. Write for dredge bulletins.



What the mechanics told the boss . . . . . .

When we unexpectedly received a duplicate order from a large dredging company for a Morris Sand Pump, one of our representatives went to investigate. The reason for the reorder—the mechanics who operated the dredge told the owner that the first Morris Pump cost considerably less to run and they liked it far better than any other make they ever had. The features of design of Morris sand, gravel and dredging pumps that win enthusiastic opinion from operators and owners alike are described in bulletins which will be sent on request.

MEMBER

For authoritative recommendations on any pumping or dredging problem, write to Morris Machine Works, Baldwinsville, N. Y. Representatives in principal localities. Export Office, 30 Church St., New York.

ages for an occupational disease allegedly contracted as a result of conditions peculiar to his employment, was claimed not to have established by evidence his contention that adequate respirators were available.

The Court holds that when the plaintiff, by his evidence, disclosed the failure of the defendant employer to have furnished and maintained a respirator for his use, he made out a *prima facie* case.

It was also alleged that the employer failed to post notices of the known danger to the health of its employees, as required by Section 13264 of the Missouri Revised Statutes, and it was for the jury to say whether its non observance of this requirement resulted in plaintiff's injury.

Silicosis

Rebel v. Standard Sanitary Manufacturing Company, decided by the Supreme Court of Pennsylvania, December 4, 1940; reported at 16 Atl. (2d) 534.

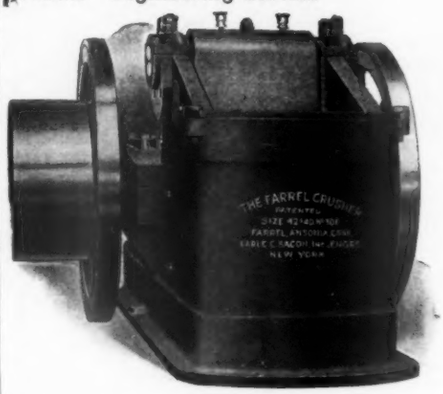
This suit arose as an action in trespass to recover damages, the plaintiff alleging that he contracted the occupational disease of silicosis while in the occupation of the defendant company, as a result of its violation of the provisions of Section 11 of the Act of May 2, 1905 (P. L. 352, 43 P. S. Section 5), which requires exhaust fans of sufficient power, or other sufficient devices, to be provided for the purpose of carrying off poisonous fumes and gases, and dust from emery-wheels, grind-stones and other machinery creating dust. A verdict for the plaintiff was awarded, and the judgment is affirmed by the Supreme Court in this appeal.

The Court holds that the employee was not required to show the availability or practicability of more sufficient devices for the prevention of dust, in order to recover; "all plaintiff was required to show was that the exhaust fans in use were not proper or sufficient compliance with the provisions of the statute." Nor is the defense of assumption of risk permissible in this type of action, for there is nothing in the employment as a welder, says the Court, that presupposes any scientific knowledge, such as a knowledge of the properties of silica dust and their injurious effects upon the body.

It was contended that the Act of 1905 was inapplicable, since it was repealed by the Act of May 18, 1937, P. L. 654, 43 P. S. Section 215-1 *et seq.* On this point, the Court rules that the plaintiff had a vested right under the Act of 1905 immediately upon the occurrence of the injury in 1935, which was not impaired by the later repeal of the statute.

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service



EARLE C. BACON, Inc.

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The Model "135" LOADER

is the fastest loading machine within $5,000 of its price, as well as heaviest, strongest and most powerful Loader built. It competes with BIG equipment. On a cost-per-yard basis, it's all alone. *Bulletin 134*

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HAISS

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Who, for nearly half a century, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Portable Conveyors—Revolving Screens

The Occupational Disease Compensation Act of July 2, 1937, P. L. 2714, 77 P. S. Section 1101 *et seq.*, was not involved in this suit.

Dormant Tuberculosis

Dailey v. Mutual Chemical Company of America, decided by the Supreme Court of New Jersey, December 9, 1940; reported at 16 Atl. (2d) 557.

Tuberculosis, in New Jersey, is not a compensable disease unless it resulted from an "accident" as that term is used in the Workmen's Compensation Act. The suit decided here was for damages resulting from the alleged failure of the employer to furnish the Plaintiff a safe place to work, as a consequence of which the plaintiff inhaled fumes, vapors and the like, which revived a dormant tubercular condition. A judgment for the plaintiff is affirmed.

The Court declares that it is the duty of an employer to provide for the employees "reasonably effective devices, means and methods to prevent the contraction by them of any illness or disease incident to the work or process in which they are engaged," and that "there was a plenitude of evidence in the instant case from which the jury might properly conclude that there was a failure of ventilation or a failure to use reasonably effective means to protect the plaintiff from the inhalation and ingestion of fumes and dust which in his case proved particularaly harmful."

It was argued that the employee had assumed the risk of sickness and injury because he knew he would be exposed to the fumes; but the Court says that "it does not follow that because he knew he would be exposed to fumes and dust that he is charged with the knowledge that inhalation of the fumes and dust would light up a dormant tubercular condition. There was no proof that plaintiff assumed the risk of this danger."

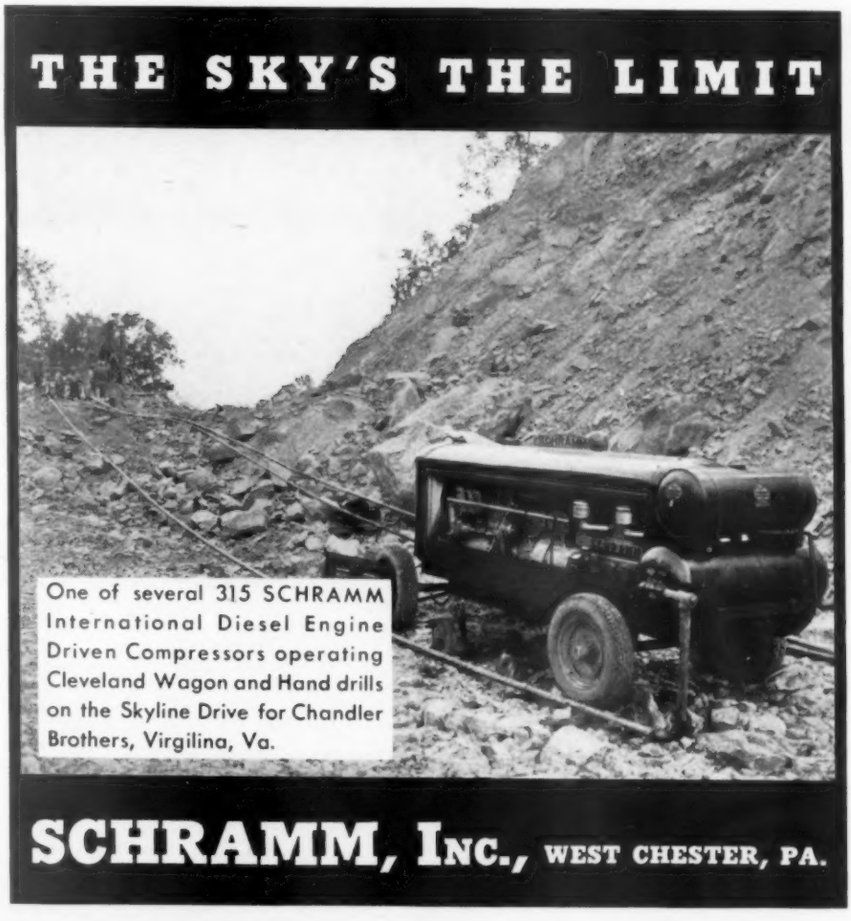
TRAFFIC NEWS DIGEST

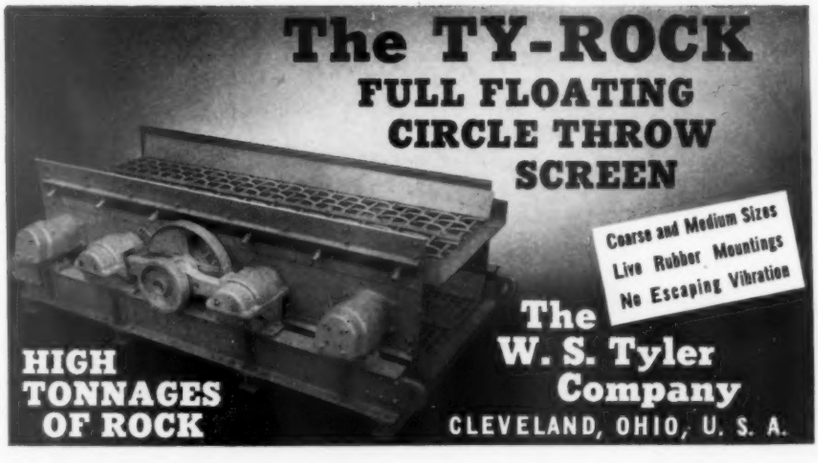
I.C.C. Decisions

Lime — Fourth section application No. 18204, lime from Missouri and Illinois to central territory. Authority was granted in fourth section order No. 14041, on conditions, to establish and maintain rates on lime, carloads, from certain origin points in Illinois and Missouri to destination points in Indiana, Kentucky, Michigan, Ohio, Pennsylvania, and West Virginia without observing the long-and-short-haul clause of section 4. The Commission stated the purpose of the relief sought was to enable applicant's circuitous routes to meet the rates of the direct routes while maintaining higher rates at intermediate points on the longer routes. Carriers which are parties to B. T. Jones' I.C.C. No. 3371 were the applicants. The origin points are Glen Park, Hannibal, Mosher, and St. Genevieve, Missouri, and Marblehead and Quincy, Illinois. The authorized rates are to be the same as those over the direct lines or routes subject to construction requirements and other conditions.

Whiting—The complainants in No. 27921, Subs. 1 to 16 inclusive, United States Rubber Company, Inc., *vs.* Pennsylvania-Reading Seashore Lines *et al.*, have filed a brief asking for adjudication of their issues raised individually and separately and presented in pleadings on and after December 3, 1937. The primary issue being rates on whiting from Camden, New Jersey, to various destinations in comparison with rates on whiting substitute from competing points in New Jersey and Pennsylvania. It was claimed in the brief that the complainants have been subjected to grave injustice by the act and acts of the defendants in exacting greater rates at 25 and 20 per cent. of first class for whiting than the defendants voluntarily made for a shipper at York and Rambeau, Pennsylvania, at rates equivalent to 12½ per cent. of first class. The complainants say the Commission should now condemn and hold the defendants in default and take the action it deems necessary to remedy the grave injustice, as the brief says, is shown to exist.

Ground Feldspar — Brockway Glass Company, Inc. *vs.* Baltimore & Ohio *et al.*, No. 28540. Heard by Examiner Harold M. Brown. The carload rate of 21 cents charged on ground feldspar shipped since April 1, 1938, from Keene, New Hampshire, to Brockway, Pennsylvania, proposed to be found inapplicable and applicable rate proposed to be found to be and to have been 25 cents. Reparation was proposed. The rate proposed to be found ap-


THE SKY'S THE LIMIT
One of several 315 SCHRAMM International Diesel Engine Driven Compressors operating Cleveland Wagon and Hand drills on the Skyline Drive for Chandler Brothers, Virgilina, Va.
SCHRAMM, INC., WEST CHESTER, PA.



plicable was the same as that claimed. The report said the complainant should comply with Rule V of the rules of practice and might include in its statement any shipments delivered during pendency of the proceeding, accompanied by proof in affidavit form that it paid and bore the charges thereon. A further hearing might be requested if defendants objected to proof in that form.

Sand and Gravel—The Commission, by division 3, in No. 28064 E. A. Keller & Sons *et al. vs.* Alton Railroad Company *et al.*, has dismissed the complaint on further hearing in its prior report, 235 I.C.C. 50, rates on sand and gravel in carloads from origins in Illinois, Indiana, and Wisconsin to certain connecting-line deliveries in the Chicago, Illinois, switching district not shown to be unreasonable or otherwise unlawful.

SECO

VIBRATING SCREENS

A substantial number of SECO Vibrating Screens were purchased right at the convention in Cincinnati, by NEW users who were so impressed with the smooth, efficient operation of the SECO.

The machine exhibited was standard in every way.

—A Real tribute to SECO . . . we think.

SCREEN EQUIPMENT CO. INC.

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The six complainants had yard locations at Blue Island, Chicago, Crawford, La Grange, and South Park, Illinois. They are served by the following railroads: Baltimore and Ohio Chicago Terminal, Belt Railway Company of Chicago, Chicago and Illinois Western, and the Indiana Harbor Belt Railroad Company.

It was found by the Commission that 46 building material dealers, including the Oak Park complainant, served directly or by means of *bona fide* trackage rights by a line—haul carrier or carriers, were accorded single-line rates from origins on such carrier or carriers and connecting-line rates fom origins on all other lines, while eight dealers, including the other five complainants, served exclusively by the belt lines, were assessed connecting line rates in every instance. According to the report the complainants contended that regardless of trackage rights the service accorded many competitors at the single-line rates was a connecting-line service because the switching was performed in certain instances by belt line crews and engines.

The Commission did not agree with this view and contended that the hauls from origins on the line-haul carriers to destinations on the belt lines could not be said to be single-line merely because the line-haul carriers own stock in the belt lines. The Commission stated that mere stock ownership is not sufficient to establish common management and control.

The Commission cited Galveston Commercial Association *vs.* Galveston H. & S. A. Railway Co., 100 I.C.C. 110, 128 I.C.C. 349, 380, and 160 I.C.C. 345 in support of that opinion. The Commission held that the Oak Park complainant was accorded as favorable treatment as any other dealer, that the disadvantage of the other five complainants appeared to be primarily one of location, and that there was, therefore, no basis for a finding of undue prejudice or preference, the issue on which the proceeding on the complaints' petition, had been reopened for further hearing.

Fourth-Section Applications

Docket 18800—Filed by J. R. Peel requesting fourth section relief to establish rates on asphalt rock, natural, or coated and crushed stone, coated, in carloads from points in Oklahoma and Texas to points in Mississippi to meet market competition.

Docket 18819—Filed by W. S. Curlett and I. N. Doe requesting fourth section relief to establish rates on cement, in carloads from Martinsburg, W. Va., to points in New England territory. Rates to apply over short tariff routes and are to be constructed on the basis of the short line distance formula. This formula being the grounds for relief.

Docket 18823—Filed by J. G. Kerr requesting fourth section relief to establish rates on asphaltic limestone, in carloads, from Cherokee, Colrock, and Margerum, Alabama, to points in the South. Filed to meet carrier competition.

Docket 18829—Filed by the A. C. L. R. R. requesting fourth section relief to establish rates on crushed stone, carloads from Columbia, South Carolina, to Savannah, Georgia. Circuitous routes being the grounds for the relief requested.

Docket 18838—Filed by the C. & N. W., C. M. St. P. & P., and C. St. P. M. & O. railroads requesting fourth section relief to establish rates on sand and gravel, carloads, from South Beloit, Illinois, to Camp Douglas, and Oshkosh, Wisconsin, to meet market competition.

Fourth-Section Orders

Docket 14043—Sand and gravel to Dundas, Illinois. Application No. 18768. Filed by R. A. Sperry on behalf of the Illinois Central R. R. Until July 1, 1941, the applicant is authorized to establish and maintain a rate of not less than 50 cents per ton of 2000 pounds for the transportation of sand and gravel, in carloads, minimum weight 90 per cent. of the marked capacity of the car, except when the car is loaded to full visible capacity actual weight will apply. Rates to apply from Riverton, Indiana, to Dundas, Illinois, and were established to maintain higher rates from and to intermediate points except from intermediate producing points; provided that the rates from and to higher rated intermediated points shall not be increased except as may be authorized by the Commission and shall in no instance exceed the lowest combination of rates subject to the Interstate Commerce Act.

Docket 13784—(2nd Supplemental)—Sand, crushed stone, and gravel to Valparaiso, Indiana. Petition filed by B. T. Jones. Fourth section order 13784 entered April 1, 1940, in application 18296 amended as modified and amended by supplemental order dated June 26, 1940. Which by its term expires Dec. 10, 1940. Order further modified and amended so as to provide that the relief authorized therein shall continue until April 20, 1941.

Docket 13967 — (Supplemental) — Gravel from La Grange, Missouri, to Illinois destinations. Application 18630. Petition filed by R. A. Sperry. Fourth section order 13967 entered Sept. 17, 1940, in application 18630, which by its terms expires Dec. 28, 1940. Modified and amended so as to provide that the relief authorized therein shall continue until June 1, 1941.

Docket 13968—(Supplemental)—Sand and gravel from Dubuque, Iowa, to Proving Ground, Illinois. Application 18631. Petition filed by R. A. Sperry. Fourth section order 13968 entered Sept. 17, 1940, in application 18631 which by its terms expires Dec. 28, 1940. Modified and amended so as to provide that the relief authorized therein shall continue until June 28, 1941.

Docket 13999—(Supplemental)—Sand and gravel to Olney, Illinois. Application 18687. Petition filed by R. A. Sperry. Fourth section order 13999 entered October 23, 1940, and application 18687 which by its terms expires December 21, 1940. Modified and amended so as to provide that the relief authorized therein shall continue until July 1, 1941.

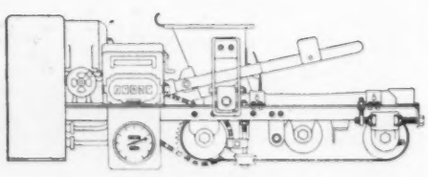
Docket 14009 — (Supplemental) — Gravel from LaGrange, Missouri, to Adair, Illinois, application 18698. Petition filed by R. A. Sperry. Fourth section order 14009 entered November 1, 1940, in application 18698 which by its terms expires December 28, 1940. Modified and amended so as to provide that the relief authorized therein shall continue until June 1, 1941.

Docket 9764—(Third Supplemental) — Cement in southern territory. Application 18770. Filed by J. D. Kerr on behalf of carriers which are parties to F. D. Miller's I.C.C. 372 other than Tennessee Central, as they participate in

"FEEDOMETER"—IT RECORDS AND TOTALS THE WEIGHT FED

It is a new development of the Hardinge Constant Weight Feeder that reads direct in tons, pounds or kilograms.

Bulletin 43



HARDINGE

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

NEW YORK, CHICAGO, SAN FRANCISCO, TORONTO

the transportation of cement in carloads from origins named therein to destinations named therein. Fourth Section Order 9764 entered March 17, 1928, in Fourth Section application 13335 as modified and amended by supplemental orders entered therein and in other applications from time to time further modified and amended so as to provide that the same measure of relief as is authorized therein with respect to rates on cement in carloads from points in southern territory to points in Official (including Illinois) territory. Shall also apply, subject to the same terms and conditions, to the same rates, when applied to the transportation of masonry cement, mortar, cement, and dry building mortar, in straight or mixed carloads from and to the same points.

NEW MACHINERY AND SUPPLIES

• Drill Bit

The Timken Roller Bearing Company, Canton, Ohio, has placed a new M Series rock bit on the market. This bit is designed for drilling unusually hard rock formations with heavy drilling equipment. Although it is a heavy-duty bit, it is intermediate between the H Series, which is normally used with light and medium-weight rock drills, and the heavy-duty D Bit Series, normally used on wagon and tripod drills.

As yet, the new M Series is available only in a limited range of sizes.

• Loader

Designed to be mounted on Caterpillar D4 or R4 tractors, the Athey MobilLoader, manufactured by the Athey Truss Wheel Company, Chicago, is a utility tool designed to provide faster, more flexible and more economical loading in a variety of uses.

Among the outstanding advantages of this equipment, the manufacturer states, is its ability to transport materials without turning to discharge load. A highly-mobile unit, the MobilLoader travels quickly from one point to another. It is equipped with an extra-large

To meet demands in the heaviest hauling field, Mack Trucks, Inc., announces production of the new Model END-605 Mack-Lanova Diesel, a new and larger edition of the Model ED Mack-Lanova Diesel engine. Similar in design and principle to the 519-cubic inch Model ED engine, this new model Diesel has a piston displacement of 605 cubic inches. It operates at the same maximum speed of 2,000 r.p.m. as the smaller Mack ED Diesel and develops 144 horsepower at that speed.

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Segments easy to assemble or replace.

Kiln Ends have a way of burning out most unexpectedly. Such accidents are not only frequent and widespread but costly.

Operators suffer heavy losses from shutdowns, repairs and crippled production . . . *except* in mills that have installed PYRASTEEL Kiln Ends.

These last for years, instead of months or weeks. They pay dividends in extra economies by saving fuel, reducing maintenance, and insuring uninterrupted kiln output.

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Buy Pipe BY RATING — NOT WEIGHT

IN Taylor Spiral you get the bursting strength, the collapsing strength and for all practical purposes the stiffness of wrought pipe weighing twice as much. By cutting the weight in half you cut the transportation cost, the handling cost, the erection cost. There is a size and gauge of Taylor Spiral Pipe for most sand, gravel and dredging needs—with joints for all services and protective coatings for all conditions.

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TAYLOR Spiral PIPE

The mobile loader.

bucket for faster loading and this bucket may readily be altered to fit many specific requirements.

Operating experience with the MobilLoader shows that it scoops up the 1½-cubic yard load, lifts it and dumps in a loading cycle of 15-20 seconds. Loading sand and gravel, it easily handles 120 cubic yards per hour.

The machine is so designed as to allow clear vision for the operator, since there is no structure in front of him to obstruct his view. In addition, the MobilLoader does not interfere with the operation of the tractor tracks, but leaves them free to oscillate normally. The rear of the tractor is clear to permit its use for other purposes.

• Screen

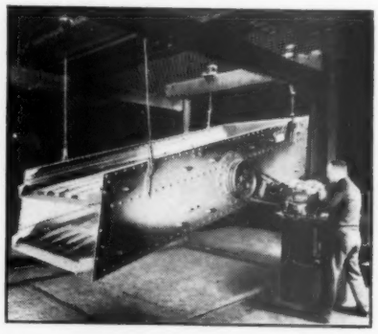
The Crushing and Cement Division, Allis-Chalmers Manufacturing Company, Milwaukee, has developed a new vibrating screen called the "Ripl-Flo," which is said to involve a new principle of operation.

Having an eccentric shaft working with the unbalanced force of the counterweighted flywheels, the new mechanism vibrates the entire screen body in rapid, circular, gyratory motion. Its smooth operating characteristics, high capacity, and neat compact design make it especially suitable for screening coal, coke, sand, gravel, stone, ore, chemical products and other granular materials.

In brief, the screen consists of two high tensile steel side plates spaced apart by welded steel deck supports, with the operating mechanism enclosed in a tubular housing between the decks. The shaft is eccentric between bearings and provides much of the force which causes the screen body to gyrate. Fine adjustments for balance are made in the flywheels externally.

The two bearings are large and of the antifriction type. One of the flywheels combines the Texrope drive sheave through which power from an electric motor is applied. The flywheels themselves do not gyrate, as the shaft is so turned that their center of rotation coincides with the center of gyration of the screen body. The power required is said to be very low, and the drive so smooth that long life is expected from the bearings and driving belts. The new screen is of the inclined type. It may be supported by cables attached to an overhead structure or to existing overhead building member. Structural floor mounted bases can be provided where this type of mounting seems preferable.

This screen will be built in single and double deck types in sizes up to and including 6 by 14 feet. The single-deck screen is so designed as to permit easy change-over to a double deck screen in the field should the occasion arise. Bulletin B-6151, giving further details, is available on request.



Screen employing new vibrating principle.

• Excavator

According to the Osgood Company, Marion, Ohio, manufacturers of excavating and material-handling equipment, its new Type 20, Model 200, a ½-cubic yard machine, embodies the latest features of modern engineering design. Machinery is compact, simple and easy to adjust and maintain.

It is a rugged and powerful machine, with special attention given to straight-line delivery of power, and simplicity of operation. Unnecessary parts have been eliminated and the design has been simplified and balanced. It is convertible to any type of service, and designed for various types of mountings, such as crawler, standard truck, and Osgood special wheel mounting. It is powered with either gasoline, or Diesel engine. Power is taken direct from the engine to the swing-and-travel shaft, by a triple-strand roller chain, fully inclosed, and equipped with sight-feed lubrication.

On the upper deck, there are only two cross shafts; on the lower frame, only one. The countershaft has been eliminated. The two horizontal shafts are mounted in roller bearings, carried in the side frames. The main-deck casting is of one-piece construction, with all machinery mounted on machined pads.

Clutches and brakes on the swing and travel shaft are of large diameter, wide faced, and controlled by a hand lever at the operator's position. Clutches and brakes on the drum shaft are controlled by Osgood "Servo" mechanism.

All vertical shafts: reversing, swing, intermediate, and travel shafts, are recessed in the deck, enclosed, keeping out all dirt and foreign matter, reducing wear and replacement costs by keeping lubricant clean.

The boom hoist is a separate unit, mounted in the left hand side frame. Crowding motion is powerful, and the retract is fast. The

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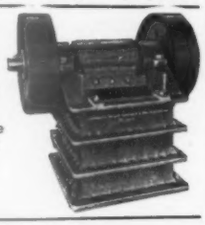

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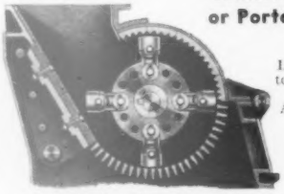

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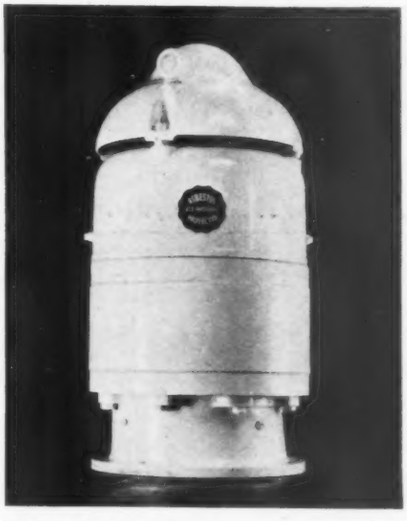
Like looking into the barrel of a big gun is this shop view through a 9-foot rotary lime-recovery kiln, 170 feet long, now under construction at the Allis-Chalmers Manufacturing Company's plant for a large paper mill. The picture was taken from the feed end. It shows the supporting blocks for the spirals and chain system used for increasing the evaporating surface and thereby lowering the exhaust temperature.



U. S. Electrical Motors, Inc., of Los Angeles, has recently developed a vertical explosion-proof motor. The new unit is suitable for vertical applications in both Class I, Group D and Class II, Group G locations as defined by the National Board of Fire Underwriters. The unit is fan-cooled and has asbestos-protected windings.

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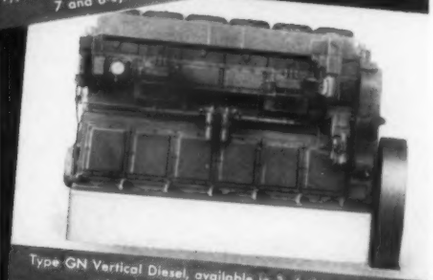

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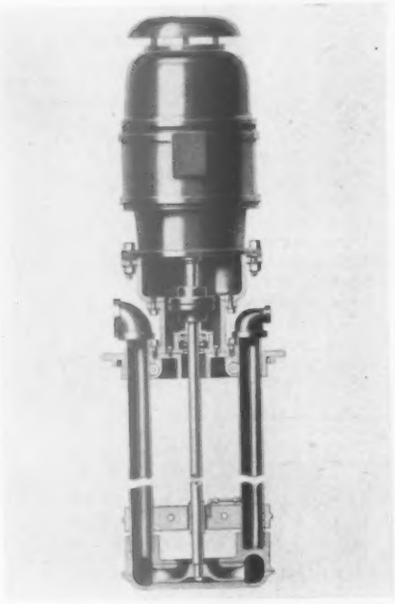
W. D. Taulman, 175 Spring Street, Atlanta, Georgia



Cut-away view of the horizontal pump.

pump with readily accessible stuffing box and sound thrust-proof bearing arrangement as on the Types "SW" (illustrated) and "QW".

Trade Literature

How to Speed up Production with Variable Speed Control, (Bulletin G-412). 24 pages. Reeves Pulley Company, Columbus, Indiana.

McLanahan Products, (loose-leaf catalog). McLanahan & Stone Corporation, Hollidaysburg, Pennsylvania.

Power Drag Scrapers, (Catalog 19-A). 24 pages. Sauerman Brothers, Inc., Chicago.

SealMaster Ball-Bearing Units, (Catalog 840), 32 pages. Stephens-Adamson Manufacturing Company, Aurora, Illinois.

The A B C's of Plastering. 16 pages. The Gypsum Association, Chicago.

Hewitt Rubber Products for Industry. 36 pages. Hewitt Rubber Corporation, Buffalo.

Robins Contractors' Screen, (Bulletin 110). 4 pages. Robins Conveying Belt Company, Passaic, New Jersey.

Appartus for Checking Thermocouple Pyrometers in Plant and Laboratory, (Catalog E-33A508). 28 pages. Leeds & Northrup Company, Philadelphia.

Amsco Nagle Industrial Pumps, (Bulletin 940). 24 pages. American Manganese Steel Division, American Brake Shoe & Foundry Company, Chicago Heights, Illinois.

Symons Cone Crusher—Short-Head Type, (Bulletin 99). 4 pages. Nordberg Manufacturing Company, Milwaukee.

Denver Horizontal Crushing Rolls, (Bulletin C16B). 8 pages. Denver Equipment Company, Denver, Colorado.

Marmon-Herrington All-Wheel Drive Trucks, (Bulletin 401129). Marmon-Herrington Company, Indianapolis.

Pioneer Traveling Grizzly Feeder, (Bulletin 536). 4 pages. *The Pioneer Trukbukit,* (Bulletin 535). 4 pages. Pioneer Engineering Works, Minneapolis.

Book Reviews

PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE, *published by the Lincoln Electric Company, Cleveland, Ohio. 1152 pages. Price $1.50.*

The sixth edition contains up-to-date facts about all aspects of arc welding and its many profitable applications. It is compiled and edited for quick reference and easy understanding, enabling anyone to keep abreast of this fast-growing industry.

The new edition contains new material on a wide variety of subjects and tells of new applications of arc welding in 35 industrial classifications.

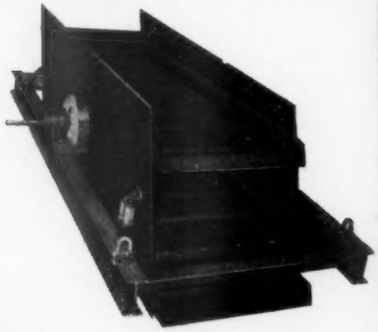
HIGHWAY USERS PAY THEIR WAY AND MORE, *published by the National Highway Users Conference, Washington, D. C. 30 pages.*

A summary of the report of Hon. Joseph B. Eastman, chairman of the Interstate Commerce Commission, on "Public Aids to Transportation." Coming from such a source, the finding that highway transportation is paying more than its fair share of road and street costs in special taxes alone, is highly gratifying to highway users, even though they would be unwilling to accept all of the principles used in arriving at that result.

Highway users do feel that they are unduly penalized by certain principles and methods of accounting in the report thereby being denied a balance of payments even more favorable.

It should be borne in mind that the study was one of transportation economics rather than of highway financing and taxation.

NEW HOLLAND Vibrating Screens



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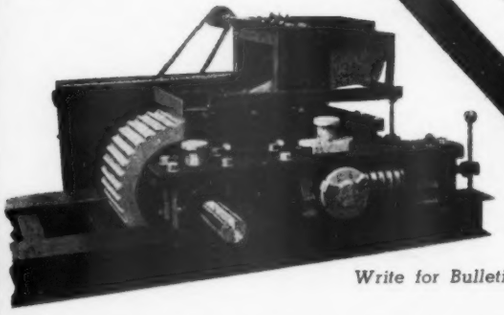

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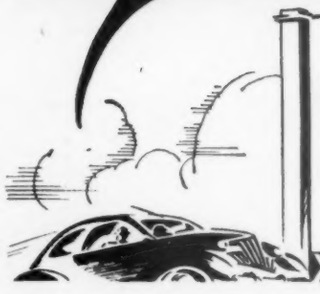

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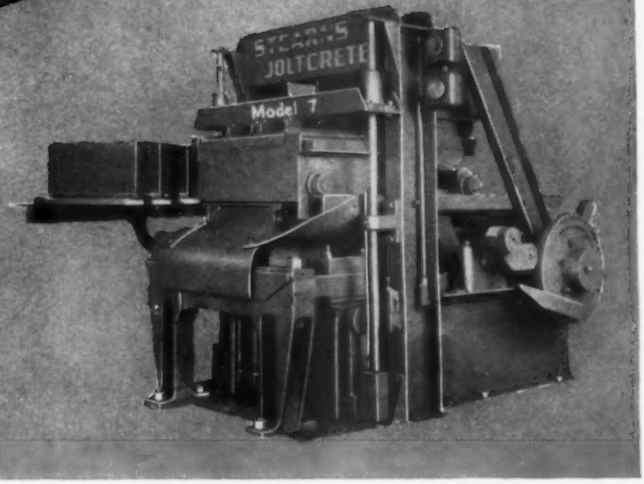

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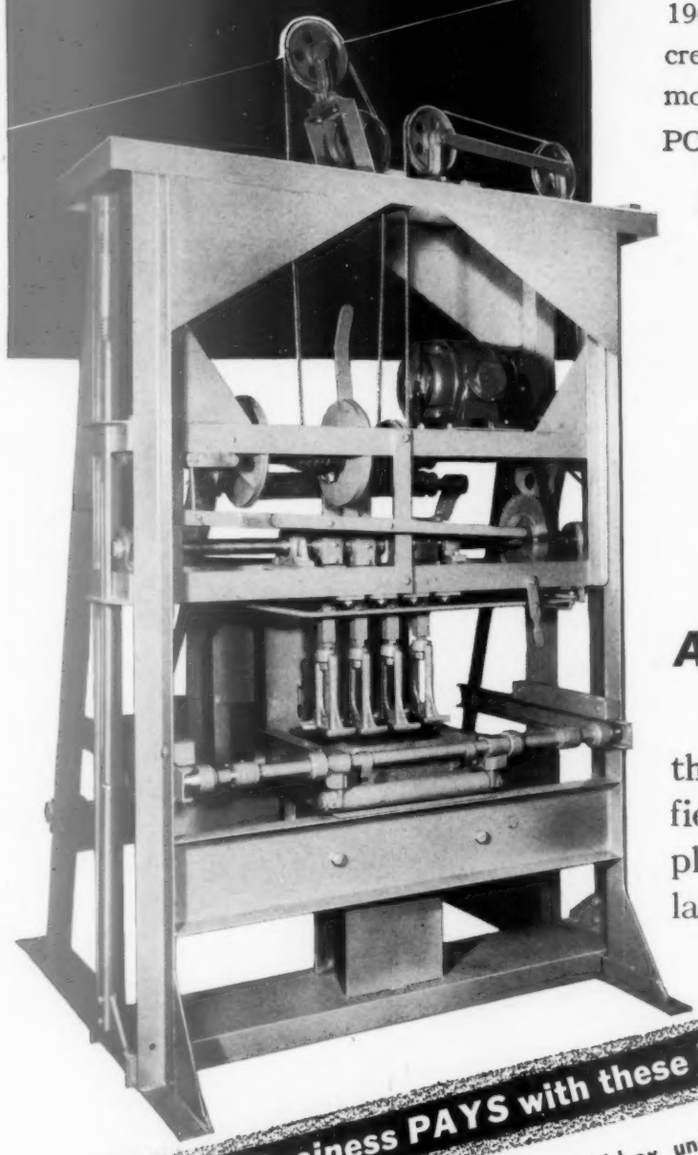

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The CONCRETE MANUFACTURER

February, 1941

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY-MIXED CONCRETE

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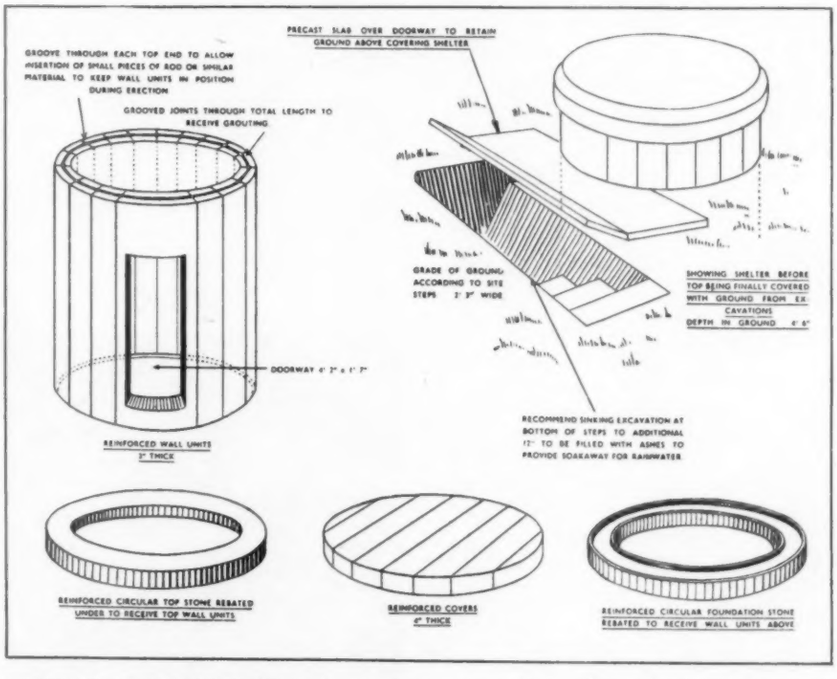
An aërial view of the John J. Eagan Homes, Atlanta housing project, built by the Atlanta Housing Authority. Burge & Stephens, architects; A. Farnell Blair, Decatur, Georgia, contractor. There are 57 buildings—548 residence units—2,116 rooms in the group. The Concrete Manufacturing Company of Atlanta supplied the equivalent of 350,000 8- by 8- by 16-inch Stearns Joltcrete blocks. Many 8- by 12- by 16-inch blocks were included.


GROOVE THROUGH EACH TOP END TO ALLOW INSERTION OF SMALL PIECES OF ROD OR SIMILAR MATERIAL TO KEEP WALL UNITS IN POSITION DURING ERECTION
GROOVED JOINTS THROUGH TOTAL LENGTH TO RECEIVE GROUTING
PRECAST SLAB OVER DOORWAY TO RETAIN GROUND ABOVE COVERING SHELTER
GRADE OF GROUND ACCORDING TO SITE
STEPS 2' 3" WIDE
SHOWING SHELTER BEFORE TOP BEING FINALLY COVERED WITH GROUND FROM EXCAVATIONS
DEPTH IN GROUND 6' 6"
RECOMMEND SINKING EXCAVATION AT BOTTOM OF STEPS TO ADDITIONAL 12" TO BE FILLED WITH ASHES TO PROVIDE SOAKAWAY FOR RAINWATER
REINFORCED WALL UNITS 3" THICK
REINFORCED CIRCULAR TOP STONE REBATED UNDER TO RECEIVE TOP WALL UNITS
REINFORCED COVERS 4" THICK
REINFORCED CIRCULAR FOUNDATION STONE REBATED TO RECEIVE WALL UNITS ABOVE

A "family" air-raid shelter built of precast-concrete units has been developed for use in England by one of that country's largest concrete-products firms, Lovering Pochin & Company. The shelter, details of which are shown in the above sketch, is designed to protect six persons standing or four sitting, according to the December, 1940 issue of "Concrete Building and Concrete Products," published in London. The components are a reinforced-concrete cover 4 inches thick, circular top and foundation units, rectangular slabs of the silo-stave type, and a precast slab to fit into the doorway. Access is by means of a trench.

1941 Convention Attendance Reflects Rapid Growth of Ready-Mix Industry

THE National Ready Mixed Concrete Association held its eleventh annual convention and exposition January 15 to 17, 1941 at the Netherland Plaza Hotel, Cincinnati, Ohio in conjunction with the 25th annual meeting of the National Sand & Gravel Association. Separate sessions were held for the discussion of problems peculiar to each industry and common problems were covered at joint sessions. Attendance was probably the best in the history of the association and keen interest was shown in the open-forum discussion of problems confronting the ready-mixed-concrete industry.

With H. F. Thomson presiding, the National Ready Mixed Concrete Association opened its open forum on operating problems on the morning of January 16. Attendance at this meeting was excellent and the interest of those present in the subjects discussed was so great that only a part of the subjects scheduled could be covered in the time allotted. As a result this session was continued to Friday afternoon so that nothing had to be omitted.

Stanton Walker, director of engineering, was first called upon for a summary of the work done during the year by the technical problems, standards, and other committees. The Committee on Standards, he said, has prepared specifications which have found acceptance in practically all the national specifications which govern the purchase of ready-mixed concrete. As an example these recommendations are incorporated in large measure in the report of the Joint Committee on Concrete and Reinforced Concrete. That committee consists of representatives of the A.S.T.M., the A.S.C.E., the A.C.I., the A.R.A., the A.I.A. and the P.C.A.

A subsidiary group, the Committee on Truck-Mixer and Agitator Standards has initiated truck-mixer standards. There are also committees on definitions and on the certification of truck-mixing and agitator equipment.

The principal requirements of purchase specifications was the first subject brought up for discussion by Mr. Walker. The existing A.S.T.M. specification drawn up in 1933, he said, has served its purpose very well but is too broad and general and a more compact specification is now needed which can be incorporated bodily into the specifications of any purchasing body. The present specifications limit the volume of concrete which may be put in a truck-mixer or agitator and for shrink-mixing. They also fix the time of mixing by specifying a minimum number of revolutions and the maximum elapsed time between the mixing and the discharge of the concrete.

John Redd (Super Concrete Corporation, Washington, D. C.), was first called upon to describe the various restrictions imposed upon ready-mixed concrete by the various governmental, state and municipal bodies among his customers. The only solution has been found in accepting each restriction as it comes along. There is a trend, he said, toward limiting the size of batches.

E. J. Nunan (Buffalo Slag Company, Buffalo,) told of a requirement of the New York State Highway Department which states that water shall not be added to a mix more than 10 minutes before mixing is started and a 10-minute maximum mixing time is required. On hauls over 15 miles the water must be put in the mixer first, then the coarse aggregate, then the fine aggregate and last the cement. Mixing is not started until the truck-mixer is 10 minutes from the job.

Several producers volunteered information concerning the mechanical spreading of ready-mixed concrete after it is discharged on a paving job. They agreed that such spreading was uneconomical and should be discouraged.

H. T. Bonavita (Maloney Concrete Company, Washington, D. C.,) told of his experiences with concrete mixed on the job for the district. District inspectors prescribed the ingredients of the mix, made regular moisture tests and supervised pouring, taking almost all responsibility off the producers' shoulders.

Hayden Brooks, Brooks-Taylor Company and R. F. Miller, Chain Belt Company, on the observation platform.

Rowland Jones (Dravo Corporation, Pittsburgh,) said that in Pennsylvania the highway department at times requires that when a load has to be hauled more than an hour the cement be added at the job. In Pittsburgh, he said, about 75 per cent. of the mixing is done at the job by choice. This is done because the contractors are often not ready for the concrete on its arrival.

C. W. Shirey (Waterloo, Iowa) said that in supplying concrete for highways the mixer load is limited to the rated mixer capacity, a serious inconvenience on hauls which often run up to 20 miles. Lion Gardiner (Jaeger Machine Company) explained that a 10-per cent. overload on the rated capacity is generally permissible and that in the newer mixers higher ratings have been made in comparison to the total drum volume. The 50-per cent. maximum load has been changed to 57 per cent.

According to William J. Hicklin (Capitol Concrete Company, Jacksonville, Florida) when ready-mixed concrete is used on naval work a locking device must be used to guarantee the time of mixing. Discussion brought out the prevailing opinion that revolution counters are more satisfactory and can be checked at the plant and again at the job. In Ohio the initial counter reading is indicated on a slip which the driver carries to the job.

Controlling the consistency of concrete was the next subject discussed. Mr. Walker expressed the opinion that some producers have come to regard the ready-mixed-concrete business as a transportation business and do not regard themselves as primarily concrete specialists. He gave lack of control of mixing water as the biggest difficulty in the way of producing uniform batches consistently. It must be remembered that the only two chemically active ingredients in concrete are cement and water. The proportions of one to the other fix the major properties of the concrete.

Mr. Walker pointed out that a difference of 10 per cent. in the moisture content of the sand in a mix may mean a variation of as much as 2.4 gallons per sack of cement in a mix designed for only 6 or 7 gallons. The failure of part of the industry to control this variable he ascribes chiefly to mental laziness. If the industry expects to keep the confidence of the purchaser and to expand its sales into new fields, he insisted that closer moisture control is necessary.

V. P. Ahearn and Stanton Walker of the National Sand & Gravel and National Ready-Mixed Concrete Associations.

There is a real place in the industry for a simple, usable and quick method for determining the moisture content and, said Mr. Walker, the association has been investigating some proposed methods. Drying the aggregates by the usual method was the most accurate method. Pouring denatured alcohol over the aggregate sample and igniting it to dry the sample was not quite as accurate but much faster. The specific gravity method was also quick but somewhat less accurate. He also described several less accurate methods with the comment that even these were better than no tests at all. Drying can be done fairly rapidly on a hot plate. Another method tried was that using some type of flask with a long graduated neck. A measured amount of sand inundated in water in such a flask gives a displacement reading from which the moisture content can be determined quickly. This and the drying method were both found to be accurate within ½ of 1 per cent. With the flask method seven determinations were easily made in an hour. Using the hot plate only three determinations could be made. In closing Mr. Walker said that every producer s h o u l d use some well-tried method of moisture determination and use it regularly throughout the day.

Further discussion brought out the fact that stock-piling sand for at least 24 hours before using helped decrease and even out the moisture content.

J. J. Warner (Richter Concrete Corporation, Cincinnati) expressed surprise that some operators are still entrusting water measurement to their truck drivers, a practice which his company discontinued 10 years ago. There are no water tanks on his trucks and all water is added at the plant. No wash-water is used. When tanks were used for wash-water one could never be sure that a driver had completely filled the tank or a control valve might be held open by a grain of sand resulting in a wet batch. Also in returning to the plant some of the wash-water might be lost from the drum due to a poorly-closed door.

Mr. Warner said that his company operates five plants, two central-mix and three transit-mix. While it is a little easier to control the slump of centrally-mixed concrete the use of proper care will give nearly as good results in transit mixing. He went on to say that his company had used moisture-determination flasks since 1918. Blueprints showing how these flasks are made were distributed among those present. These flasks, he said, can be made for about $5.00.

In reply to questions Mr. Warner described the methods of control used in his plants to insure a consistently good product. Service men are employed to look at jobs before concrete is delivered to make sure that forms and handling facilities are adequate. These men are also qualified to handle any complaints and to make field tests if necessary. The truck drivers, he said, wash out the mixers as often as necessary and this works out very well as the driver must chop out any hardened concrete on his own time and is, therefore, not likely to let this happen.

Mr. Thomson then introduced Professor Roy B. Crepps of Purdue University, who stressed the point that the moisture content of aggregates was the most important factor in designing a mix. He also mentioned the difficulty of producing a workable concrete with an arbitrary mix.

Alexander Foster, Jr. (Warner Company, Philadelphia) said that the variation in the distances to which succeeding loads of concrete are delivered makes control of consistency difficult because of the grinding action which takes place in the drums. He also said that in the concrete plant nearest the source of aggregates it is most difficult to control the moisture content. The reason is that this plant receives sand and gravel in carload lots while deliveries to the more distant plants are made in barges.

Mr. Foster prefers a moisture container which is standard with the U. S. Bureau of Reclamation and recommended that those interested get a copy of the handbook of that organization which contains much valuable information on testing. As a further check on consistency of concrete the Warner Company uses plant mixers with only half the capacity of the truck-mixers. Then if the first batch is too wet or dry this can be compensated for it the second batch.

Lion Gardiner mentioned a new condition which has become apparent on the Pacific coast recently. For some reason operators there are getting lumps

Alexander Foster, Jr., Warner Company, Philadelphia, and Lloyd Wilson, Ransome Concrete Machinery Company.

of cement as large as foot-balls in their mixers, something which never happened before. This only happens when a concrete with a slump of 5 inches or over is made. Some attribute this to the aluminum stearate in the cements. According to Mr. Gardiner the least difficulty was experienced when the aggregates and cement were ribbon-loaded together into the mixer.

Several cement men in the room were called upon to describe the reaction of various grinding aids on the use of these cements in truck-mixers. One said that such cements are puffy and difficult to handle but that he had never heard of their causing the concrete to ball up. Another suggested that thorough dry mixing before water was admitted into the mixer should alleviate this condition. Mr. Gardiner commented that it was strange that such balling up should start now when for eight years the same mixing methods had been used.

In response to a question from Mr. Walker, it developed that several operators present occasionally used non-agitating units for the delivery of concrete.

Because of the late hour it was then decided to continue this open forum later during the convention. Time was found for further discussion following the combined meeting of both associations Friday evening.

Mr. Walker re-opened the discussion with the remark that although the A. S. T. M. limit on the time cement may be in contact with water before delivery is 1 hour and 30 minutes, the more common specification was 1 hour and 45 minutes. He advised a maximum of 15 minutes when high-early-strength cement or hot water is used.

H. F. G. Pelsue, (Graham Brothers, Los Angeles) said their practice of adding water first, then sand, coarse aggregates and cement, is all right for long hauls but limits the size of a batch.

The subject, volume of fresh concrete versus apparent volume of hardened

concrete in forms, was introduced by Mr. Pelsue with the remark that his firm takes a firm stand on being paid for the amount of concrete delivered, not for the supposed volume in the forms.

E. B. Rayburn, Jr., (Ready Mixed Concrete Company, Indianapolis) said almost all sales are made on a strength basis since the plant was started in 1931, and that this was achieved by educating the architects. To be on the safe side all mixes are designed for a 500-pound excess strength. Mixes are designed for strengths as low as 1,500 pounds for certain public-utility applications.

Cold weather concreting was the next subject. A. R. Shiely (J. L. Shiely Company, St. Paul) said his company makes an extra charge from November 1 to April 1 for heating concrete. If heating is necessary during other months no charge is made. The charge is 35 cents per cubic yard for small orders and 25 cents for large orders. To eliminate the frozen-sand problem the inundation system is used with two tanks of 1- and ½-cubic yard capacities supplemented by a weighing batcher. Hot water in these tanks heats the sand. Cement is heated by running the boiler stack along the bin and aggregates by steam coils in the bins. These coils are protected by angle irons over them. To further insure proper heating doors are used which are opened only to let a truck in or out of the plant. Loads are guaranteed to exceed 60 degrees F. at the job and the heat loss is only 5 degrees on a 5-mile haul.

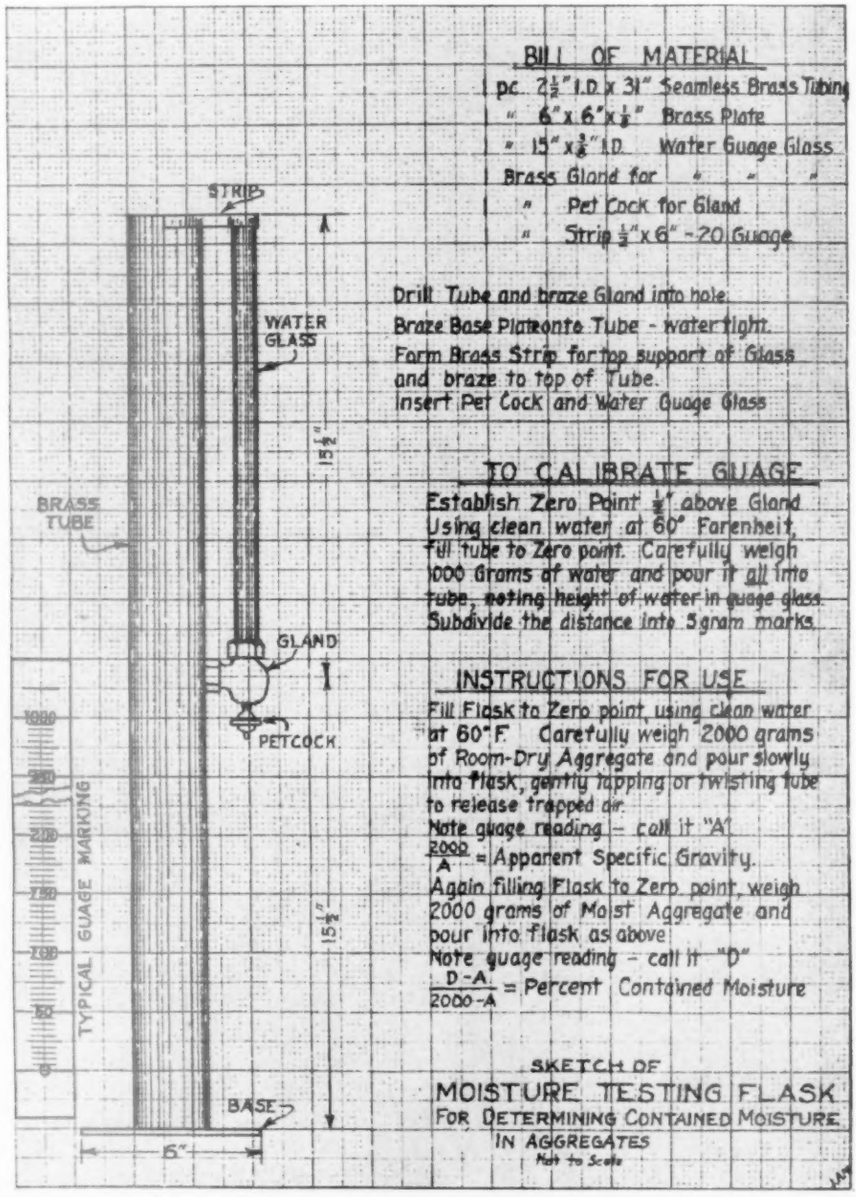
Discussion brought out the fact that many specifications permit the use of mixing water heated up to 200 degrees F. while others have a maximum as low as 120 degrees.

Mr. Shiely said that the use of part natural cement in a mix improved workability with only a slight loss of strength. Mr. Walker told of the use of half natural and half Portland cement in New York state for greater resistance to the salts used on highways during cold weather. In closing the open forum Mr. Walker said that the use of fly ash in concrete may be an early development and that this subject would be discussed at the coming meeting of the American Concrete Institute.

The ready-mixed operators resumed their Thursday session after luncheon in the Hall of Mirrors with Robert Mitchell (Consolidated Rock Products Company, Los Angeles) presiding. Executive Secretary Ahearn reviewed briefly the gains and accomplishments of the association during the year just passed, laying particular emphasis on the effect of Federal legislation and problems created by the dangers of war on the industry. So far, he pointed out, no prevailing-minimum-wage scale has been established for the ready-mixed-concrete industry under the Walsh-Healey Act. He also urged that members refrain from asking deferment for employees under the Selective Service Act except in extreme cases where the indispensability of the worker can be clearly shown. And in connection with the employment of men to replace those drafted, he urged that an agreement be made in writing that such employment is to cease when the original worker completes his term of military service. This, said Mr. Ahearn, will allow the employer to comply with the compulsory reëmployment provisions of the act and will avoid any misunderstanding or friction among the workers themselves.

Except for the reëlection of officers and directors of the association and the introduction of several new members who were in attendance for the first time at the convention, the remainder of the afternoon session was taken up with an analysis, discussion and step-by-step explanation of the *Manual for the Ready-Mixed-Concrete Industry* which has been in the early stages of preparation for nearly two years and which, it is hoped, will be printed and ready for use before convention time rolls around again.

As chairman of a special association committee, the execution of this task is being directed by H. F. G. Pelsue (Graham Brothers, Inc., Los Angeles), assisted by H. F. Thomson (General Materials Company, St. Louis), and R. C. Collins (Warner Company, Philadelphia). Mr. Pelsue explained that the manual was conceived as a sales help


BILL OF MATERIAL
1 pc. 2½" I.D. x 31" Seamless Brass Tubing
" 6" x 6" x ¼" Brass Plate
" 15" x ⅜" I.D. Water Guage Glass
Brass Gland for " " "
" Pet Cock for Gland
" Strip ½" x 6" - 20 Guage
Drill Tube and braze Gland into hole.
Braze Base Plate onto Tube - water tight.
Form Brass Strip for top support of Glass and braze to top of Tube.
Insert Pet Cock and Water Guage Glass
TO CALIBRATE GUAGE
Establish Zero Point ½" above Gland
Using clean water at 60° Farenheit, fill tube to Zero point. Carefully weigh 2000 Grams of water and pour it all into tube, noting height of water in guage glass. Subdivide the distance into 5 gram marks.
INSTRUCTIONS FOR USE
Fill Flask to Zero point using clean water at 60° F. Carefully weigh 2000 grams of Room-Dry Aggregate and pour slowly into flask, gently tapping or twisting tube to release trapped air.
Note guage reading - call it "A"
2000/A = Apparent Specific Gravity.
Again filling Flask to Zero point, weigh 2000 grams of Moist Aggregate and pour into flask as above
Note guage reading - call it "D"
(D-A)/(2000-A) = Percent Contained Moisture
STRIP
WATER GLASS
BRASS TUBE
GLAND
PETCOCK
BASE
15½"
15½"
6"
TYPICAL GUAGE MARKING
1000
200
150
100
50
0
SKETCH OF
MOISTURE TESTING FLASK
FOR DETERMINING CONTAINED MOISTURE IN AGGREGATES
Not to Scale

The moisture-determination flask described by Irving Warner, Warner Company, Philadelphia.

originally but that its scope has been broadened to cover the industry in its entirety, including important sections on the subjects of service and production technique. He was gratified, he said, for the assistance so far rendered among the members. Of 82 questionnaires sent out recently, 47 have already been returned with information that will be helpful in preparing the book.

The first section, Mr. Pelsue explained, will consist of a "Foreword," setting forth the object of the manual and an expressed hope that the subject matter contained therein, if put into practice, will set and maintain a high standard for the industry as a whole.

The second section will be devoted to a history of concrete in general and the ready-mixed industry in particular, tracing the development of the material to its present standard. This section is also to contain the origin, purpose and development of the association since it was formed 11 years ago. Some sentiment developed at the meeting for including here a statement covering the rigid requirements which must be met before membership is accepted and the matter will be given due consideration.

Section III will be left open for a history of the local company using the manual, together with a statement of policies, etc., which are governed by local conditions. An outline will be included for members to follow in preparing the material which is to be inserted, since the book will be bound in loose-leaf form.

The fourth section of the manual will cover the product itself, defining central-mixed concrete and dry-batched, or truck-mixed, concrete. The essential facilities utilized, including bins and hoppers, mixing equipment and trucks, weighing devices, water-measuring instruments, equipment for the determination of moisture in the aggregates, and desirable laboratory equipment will be gone into and described in detail. This will stress the painstaking care which goes into the preparation of the material.

The next section will be devoted to the organization set-up, indicating the functions of the personnel and the part each plays in delivering to the job concrete to meet the specifications for that particular job.

Section VI will be devoted to "Selling the Product." A suggested outline was adopted which will cover the subject under these sub-divisions: (a) the company's sales policy; (b) general ready-mixed-concrete sales theories—the merchandising function and the sub-contracting function; (c) sound pricing policies; (d) the advantages of the ready-mixed product over the job-mixed material; (e) the "do's and dont's" of selling; (f) advertising and publicity—its general nature, who should be reached, and the media to be employed in accomplishing it.

"Service" will be the broad subject of the next section of the manual and the necessity for booking orders carefully, the importance of promising deliveries and the conscientious fulfillment of these promises will be given thorough treatment. The necessity for complete coöperation from the contractor will also be stressed. The need for adequate personnel to check each job served will be brought out and it will be shown that this will involve (a) seeing that proper roadways are provided for; (b) making certain that the job is not "over-serviced"; (c) seeing that orders are placed on time; (d) facilitating the release of trucks on the job, and (e) advising on the suitability of the concrete being delivered to meet the conditions of the particular job. The section will contain also a sound statement of policy regarding "standing time."

The section to follow will cover the technological aspects of the business. It will point out the necessity for careful, able and accurate workmanship in the production of concrete. Technical information will cover the various types of cements, aggregates and aggregate characteristics, and specifications and test methods for the ingredients of concrete.

As planned, the concluding section of the manual will be devoted to "Specifications and Proportioning." The reasons for such specifications will be explained, the types of existing specifications will be analyzed, and typical specifications covering proportioning and mixing will be presented.

The industry as a whole is looking forward to the publication of the manual with anticipation, feeling that it will set a standard for an industry that has come a long way from the hit-or-miss procedures in vogue 15 years ago.

The association's officers for 1941, all reëlected, are: Joseph H. Dixey (New York), president; H. F. G. Pelsue (Los Angeles), Stephen Stepanian (Columbus, Ohio), and A. J. O'Connor (Detroit), vice-presidents; Don Reynolds (Boston), secretary; and Alexander Foster, Jr. (Philadelphia), treasurer.

Many of the delegates attended the annual dinner in the evening.

Lime-Putty Operators Discuss Marketing, Technical Topics

MANUFACTURERS of lime putty met January 18 at the Netherland Plaza, Cincinnati, to discuss operating and merchandising problems and to determine matters of policy. To establish the Lime Putty Manufacturers' Association on a more stable basis it was agreed to set a fixed membership fee of $10 a year and to make the president, O. Stanley Smith, serve as treasurer as well. The president was asked to name a committee to draft an advertising circular explaining the many advantages of lime-putty mortar.

Many interesting facts were brought out in the discussion of operating problems, although, as the industry has become more mature, these are giving way in importance to those involved in marketing and merchandising.

Herbert Jahncke (Jahncke Service, Inc., New Orleans) told of having furnished 30,000 cubic yards of lime putty for three slum-clearance projects in New Orleans. The usual mixes are 1:1:6 when slag cement is used and 1:1½:6 when Portland cement is used. Hayden Brooks (Standard Building Material Company, Birmingham) said that his company, in producing 27,000 cubic yards of lime putty last year, did 90 per cent. of the total business in the city. His company uses pozzuolanic cement which is about 15 cents a barrel cheaper than Portland cement and, it is claimed, makes better mortar. Mortar made with pozzuolanic cement acquires its initial set in 4 hours.

In the early days of the lime-putty business it was assumed that some type of mixer-truck, such as is used in the ready-mixed-concrete industry was necessary for delivering the product. One manufacturer reported that he is using agitator trucks for this purpose, but only because, having turned to the use of truck-mixers in his ready-mixed-concrete business, he has this old-type equipment available. Another manufacturer reported that his customers, the dealers, carry away his product in their own dump trucks, a type of equipment that has proved entirely satisfactory for the delivery of lime-putty mortar. Dump trucks are used by other producers with similar results.

Some producers are revising their scale of commissions to dealers. One reduced his commission from $1.25 per cubic yard to 50 cents by the simple method of doing personal promotion work among contractors and others. The average dealer, because of the larger gross profit he can make in the sale of packaged mortar mixes, may not do much to promote the sale of lime-putty mortar, although one manufacturer pointed out that the sale of the

Some of those present at the lime-putty meeting. Left to right, front row: Herbert Jahncke, Jahncke Service, Inc., New Orleans; O. Stanley Smith, Concrete Construction & Supply Company, Columbia, South Carolina. Second row: Murray S. Simpson, Super Concrete Corporation, Washington; W. L. Heston and D. W. Thompson, Heston Concrete Company, Indianapolis; Milo B. Smith, Chicago Bridge & Iron Works, Chicago. Back row: M. A. Midlan, Richter Concrete Corporation, Cincinnati; Hayden Brooks, Standard Building Material Company, Birmingham; M. Brisch, Jr., Rockwell Lime Company, Chicago; R. W. Greene, Lowell Lime Mortar Company, Louisville; Stanley A. Phillips, Pit and Quarry.

latter product involves no investment in inventory or delivery trucks and that it should, therefore, result in as much profit to the dealer, even on a 50-cents-per-yard basis, as the sale of the packaged merchandise.

One producer sells his mortar at $5.00 per cubic yard less 5 per cent. and at 75 cents more in small lots. He favors a 1:2:7 mix as more workable. Another manufacturer's price is $5.00 less 10 per cent.

Most of the manufacturers' advertising is limited to mailing pieces, although one does make use of local construction journals. Newspapers do not seem to have won favor.

One manufacturer has made effective use of masons' gages, which carry no advertising but are presented to the masons on the job by a company representative. The cost is 50 cents each.

Another manufacturer has used masons' tool bags with good results. These are well made and durable, and can be purchased at from 50 to 94 cents each.

Hayden Brooks told of the success he achieved, when his business was started 15 years ago, by the distribution of white union-labor-made overalls to masons. The masons on the job were given cards which they were required to fill out with their names, sizes, etc. and to present at the lime-putty plant. By getting the men to come to the plant it was possible to show them how the mortar was made and to impress them with the efficiency of mortar manufacture. On the presentation at the plant of their worn-out overalls the masons were presented with new ones. This plan won acceptance of Mr. Brooks' lime-putty mortar within 30 days.

Trouble with pumps was reported by several manufacturers. A Kansas City manufacturer of 15 years' experience said that his troubles were finally eliminated by the installation of a Wilfley sand pump which gave satisfaction in this work.

Water pockets in mortar in storage have not been eliminated as a source of trouble in some plants. One manufacturer has overcome the difficulty by agitating the putty in his tanks twice daily during the aging period.

Caking of the putty remaining on the walls of the tanks after discharge can be removed by washing the inside walls down to the level of the putty during or immediately after each withdrawal.

As evidence of the superiority of lime-putty mortar made in central plants over the product made on the job one producer cited the fact that a contractor bid $1 less per 1,000 bricks when his mortar was used than when the contractor's own putty was used. Another manufacturer reported that a brick contractor in his city rebated 60 cents per 1,000 bricks to his contractor when aged lime-putty mortar was used.

Some satisfactory use of lime-putty plaster has been made for white coats and scratch coats, although the volume is usually not large enough to warrant any special effort to get such business. Mr. Brooks said that lime burned in rotary kilns in the South will make satisfactory white-coat plaster but not that made in shaft kilns. Both types will require more gaging to make them suitable for plaster.

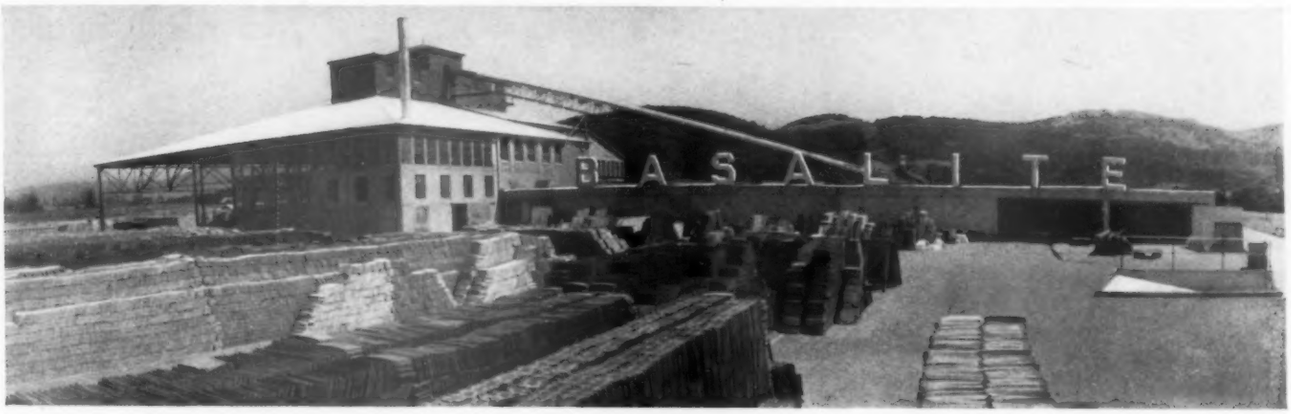
Trucking costs vary somewhat from city to city, depending on local labor costs, average length of haul, and other factors. In Birmingham the cost is 45 cents an hour, which works out at an average cost per cubic yard of 75 cents. In this case a 1-cubic yard mixer can load 2 tons (the average load) in 4 minutes. The average haul is about 4 miles. In Chicago the average cost is from 85 to 95 cents an hour, in Cincinnati about 80 cents an hour (giving a labor and fuel cost of 80 cents a cubic yard). In New Orleans the average cost is 40 cents a cubic yard for 2- or 3-cubic yard loads; in Columbia, South Carolina, it is 40 cents a cubic yard, of which 37½ cents represents the cost of the driver; in Kansas City it is 10 cents a ton for hired trucks.

It was decided to hold the next annual meeting immediately after the close of the next annual convention of the National Ready Mixed Concrete Association convention, as was done this time. O. Stanley Smith and Herbert Jahncke were reëlected president and secretary respectively.

The following members and guests were present:

M. Brisch, Jr., Rockwell Lime Co., Chicago.
Hayden Brooks, Standard Building Material Co., Birmingham, Ala.
Henry Gish, Stewart Sand & Material Co., Kansas City, Mo.
Robert Greene, Lowell Lime Mortar Co., Louisville, Ky.
W. L. Heston, Heston Concrete Co., Indianapolis, Ind.
Herbert Jahncke, Jahncke Service, Inc., New Orleans, La.
M. A. Midlan, Richter Concrete Corp., Cincinnati, O.
Bror Nordberg, *Rock Products*, Chicago, Ill.
Stanley A. Phillips, PIT AND QUARRY, Chicago, Illinois.
John Redd, Super Concrete Corp, Washington, D. C.
Murray S. Simpson, Super Concrete Corp., Washington, D. C.
Milo B. Smith, Chicago Bridge & Iron Works, Chicago, Ill.
O. Stanley Smith, Concrete Construction & Supply Co., Columbia, S. C.
D. W. Thompson, Heston Concrete Co., Indianapolis, Ind.
H. F. Thomson, General Material Co., St. Louis, Missouri.
W. E. Trauffer, PIT AND QUARRY, Chicago, Ill.
Stanton Walker, National Ready Mixed Concrete Assn., Washington, D. C.
J. J. Warner, Ritchter Concrete Corp., Cincinnati, O.

Demonstration Houses Create Demand for "Basalite" Blocks in California



A general view of the concrete-products plant, yard and roof tile curing rooms near Napa.

By W. E. TRAUFFER

WHEN the Basalt Rock Company built its large and very modern concrete-products plant near Napa, California, other producers awaited developments with considerable interest. As president and general manager of this company for many years, Albert G. Streblow had made it one of the leading aggregates producers on the West Coast. Sand and gravel, light-weight aggregates, rip-rap, ready-mixed concrete and bituminized aggregates had all been added to its line of products from time to time, and proved profitable, but this was different. No one had ever made a big success of concrete building units in the San Francisco Bay area and much educational work would have to be done.

In 1934 Mr. Streblow built a small experimental plant and found that a real market, which would justify erecting a larger plant, was awaiting. In 1936, after having visited many operations in this country, he went to Europe and studied particularly the manufacture of products made from pumice concrete which have been in great demand there for years. Returning to this country, Mr. Streblow designed his plant on the basis of what he had learned and put it in operation in 1937. No reasonable expense was spared to provide the best available in plant, equipment, methods, etc. The name "Basalite" was adopted to identify these building units with the company's other products and to stress its lightness, which Mr. Streblow considers an important feature. These blocks are nailable and can easily be cut into any desired shape. Early in 1940 the capacity of the plant was greatly increased to keep up with the demand and has operated at capacity ever since.

Mr. Streblow believed that there was no point in entering this field unless he did so on a large scale, and that a real impact was necessary to create a demand. The reputation and prestige of the company were a big help and the usual model houses, advertising, etc., were utilized. Progress was slow at first because of a real public prejudice against the old poorly-made blocks and the prevailing idea that a concrete-block building must necessarily be cold, square and ugly. Architects and contractors were also slow to be convinced, but they have been gradually won over.

In getting started the company purchased a small tract of land in Napa and built several houses, which were sold when completed. In this way members of the organization were familiarized with the problems involved in this type of construction and found solutions for them. This first-hand experience also taught them how to estimate the quantities required, the allowances that must be made for plumbing, wiring, etc.

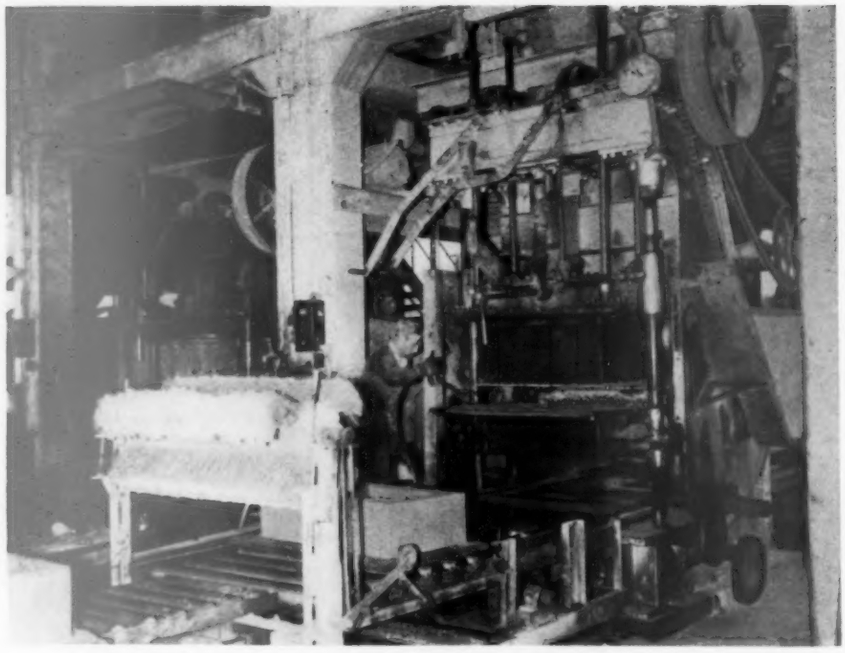
After this project was completed the company left the construction field but has kept close contact with construction problems. Many improvements have been made in its products and production methods as a result of this contact.

Two full-time salesmen, who are familiar with all roof and wall problems, are employed. The best method of breaking into a new town has been found to be to concentrate sales efforts there until one house is sold and built. This house is then exhibited for a short time and even after it is occupied continues to be a booster for the company's products.

Because of the low cost of production, and the light shipping weight of the company's products, the ordinary marketing area comprises all the territory within a radius of 150 to 200 miles. Shipments have actually been made all over the state by truck and to even more distant points by rail. Truck shipments have resulted in the least breakage as there is no rehandling and delivery is made direct to the job sites.

The company has now furnished building units for many hundreds of houses, stores, filling stations, schools, hospitals, and other structures and has proved conclusively that good products, backed up by intelligent sales efforts, can be made to pay. The most publicized building in which Basalite products were used was "The Californian," an all-concrete model house which attracted many thousands of visitors at the Golden Gate International Exposition on Treasure Island in San Francisco Bay. This building illustrated the use of various types of building materials, including a wide range of Basalite products. These units were used for both outside and inside wall construction. The floors were of concrete slabs with Basalite sleepers to which the floor joists were nailed. The roof was made of Basalite cambered shingle tile, weathered shake design.

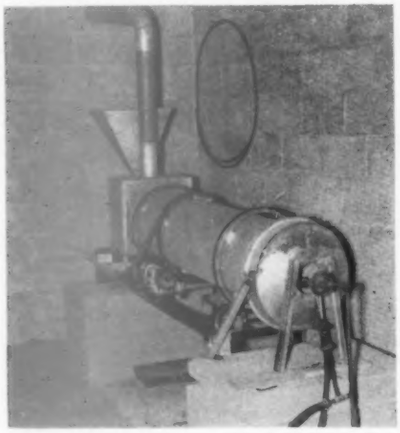
The writer liked even better the new home which Mr. Streblow recently completed. Situated on top of a hill overlooking the surrounding country, this reproduction of a Spanish hacienda is Mr. Streblow's conception of the ideal home. Basalite was, of course, used wherever possible. This house incorporated many improvements over pres-



The new tamper block machine with old machine at left. Brush in foreground automatically cleans tops of blocks.

ent building practices, and is entirely fireproof.

Another Basalite house which has received nation-wide publicity is the



Miniature rotary kiln used for testing purposes in the plant laboratory.

one built for Eugene O'Neill, the eminent play-wright, in the Mt. Diablo foothills. It has been described in all the West Coast and national architectural publications.

The company's plant is located on a heavily-traveled state highway just outside Napa, and its appearance is one of the company's best advertisements. The building is built around the aggregate bins and around it is a steel-frame structure with a Basalite slab roof. All the work is done under this roof. The building is open on all sides except the south and southwest, which are inclosed with Basalite precast slab and steel-sash windows for protection from the winter storms which invariably come from that direction.

All the aggregates used in this plant are hauled in trucks and discharged into a hopper at the plant. A 26-inch by 150-foot covered belt-conveyor discharges them through a pant-leg hopper on a 24-inch by 28-foot shuttle belt-conveyor set at right angles to the main conveyor. The shuttle conveyor is reversible and can be moved to discharge into ten of the twelve 60-cubic yard compartments of the reinforced-concrete storage bin. These compartments are arranged in two rows. The hopper is also movable so that the other two bins can be filled direct from it over the end of the shuttle conveyor. The conveyor belting was supplied by the Pioneer Rubber Company.

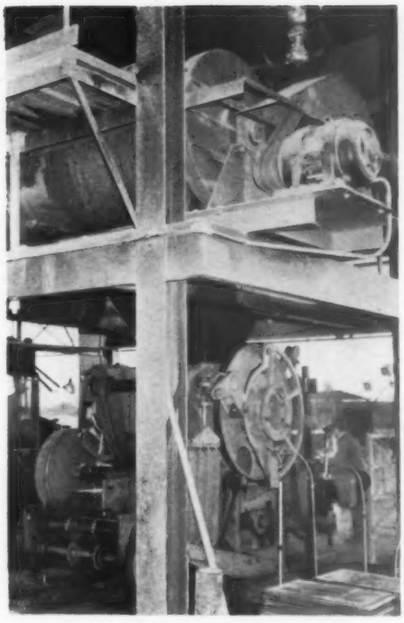
The materials kept in storage include two sizes of pumicite ($\frac{1}{8}$- to $\frac{7}{16}$-inch and minus $\frac{1}{8}$-inch), Sacramento River plaster sand, Antioch sand, and Healdsburg concrete sand, pea gravel, $\frac{3}{4}$- and $1\frac{1}{2}$-inch gravel. Most of these materials are used only for ready-mixed concrete. The Basalite shingles and building units are made with pumicite and a small percentage of sand.

Under each bin compartment are two manually-operated sliding gates. Under one of the two rows of bins is a traveling weigh larry or batcher running on overhead rails. Two larries are operated under the other row of bins. One of these was installed to serve only the new vibrating block machine. Each larry has a capacity of 5,000 pounds and has a Fairbanks dial scale. A larry is moved into place under the various bin compartments and the desired ingredients are weighed cumulatively. The larry is then moved over the correct passage to discharge into truck-mixers, the block-machine mixers or the tile-machine mixer, as the case may be. Cement is purchased in car load lots and is brought to the plant by trucks. The required amount for each batch is dumped into the mixers from sacks.

Superintendent Kay demonstrates the making of roofing tiles by hand.

The 30-cubic foot mixer serving the two tamper block machines has screw-action blades of the company's own design. Concrete is discharged into the hoppers of the Bendörfer automatic

Truck discharging aggregates to hopper with conveyor to plant bins.



The new vibrator block machine with its mixer above.

block machines. A moving mixing hopper passes over the mold and feeds the concrete into it. The mold is then vibrated in a vertical plane, after which the product is tamped to the desired height. The accurate water and batching control make it possible for an ex-

The mixer for the vibrator block machine with weigh-batcher and scale.

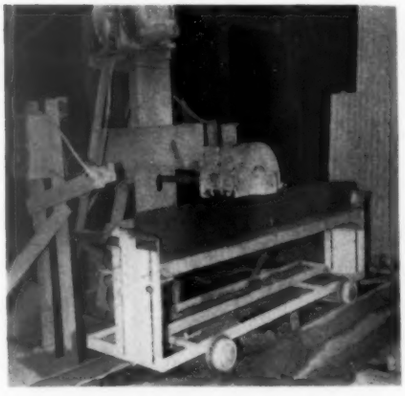
perienced operator to produce a product which is remarkably uniform in density and other characteristics.

Up to this point all the operations are automatic. The operator of the original machine removes the pallet and the products from the machine by means of a hand lever on a continuous double-cable conveyor. This carries the products under a revolving brush which is started by the contact of the cables on the pulleys. This brush cleans off the tops of the blocks, which are then transferred to racks to be hauled away for curing by a new Clark Tructractor and Barrett-Cravens lift trucks.

The tamper block machines make all their products in multiples, separate molds and dies being used for each of the 15 varieties made. A special 4-wheeled hoist was built to handle the molds and tamper dies, which, with the pallets, are made in the company's shop. The old machine makes at one operation five 8- by 8- by 16-inch, six 6- by 8- by 16-inch, nine 4- by 8- by 16-inch or twelve 3- by 8- by 16-inch units. The number of other sizes made is in proportion.

The new tamper machine is very similar in design but can make blocks up to 18 inches in height. It has a power roller takeoff and automatic clutch-driven brush.

The new Besser Vibrapac is served by a Besser 50-cubic foot mixer. Water is measured with a Virginia water meter. The Vibrapac is fully automatic except that pallets are put in by hand and the blocks are taken away by a

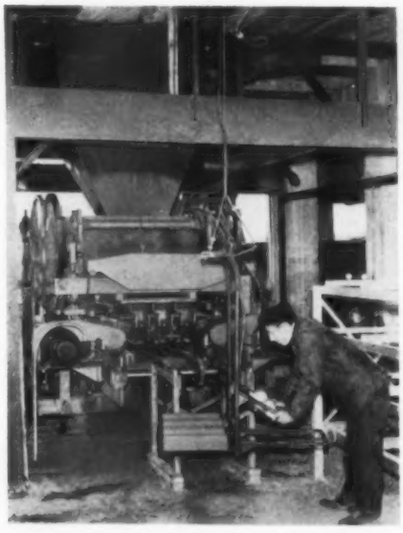


Machine which cuts and grooves the blocks.

Besser off-bearing hoist and hook. The cam control and vibration of this machine are adjustable within limits. This machine has a capacity of ten standard 8- by 8- by 16-inch blocks per minute. With one man on the mixer, one on the machine, and an off-bearer-and-palletman 4,500 blocks are made in an 8-hour day. The same plain pallets are used for all sizes of blocks made. At one time this machine can make three 8- by 8- by 16-inch standard or beam blocks, three 4- by 8- by 16-inch standard or beam blocks, four 8- by 6- by 16-inch blocks, six 8- by 4- by 16-inch blocks, seven 8- by 3- by 16-inch blocks, etc.

The twelve steam-curing rooms are kept warm and humid by means of full-length floor pans filled with water heated by steam coils. The units are left in these rooms overnight for about 12 hours before they are removed to outdoor storage. Here they are covered with membrane paper and are wetted for 2 or 3 days before being exposed. The curing rooms have counterbalanced steel doors and have a combined capacity for 16,570 standard blocks.

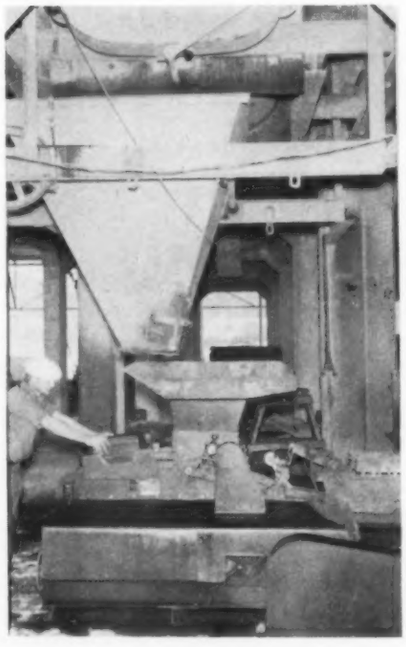
The shingle-tile machine has the same type of mixer as the tamper block machines, but a movable hopper makes it possible to discharge the concrete into carts for the manufacture of specials, hand-made tiles, etc. The shingle-tile machine was made by Powell & Hill, Ltd., Croydon, England. The tiles be-



Carrying away blocks from the new machine on a hoist and hook.

ing made by it are Prosley patented all-cambered units with nail holes and nibs. All sizes of tile are made on the same 13- by 12½-inch cast-iron pallets. On a pallet can be made one 13- by 12½-inch, one 13- by 8-inch, one 9¾- by 12½-inch, two 6½- by 12½-inch, or three 3¾- by 12½-inch tiles. These can be made at the rate of 2,400 pallets per hour.

Two men feed the machine with pallets while a third feeds it with concrete.



The shingle machine with hopper and mixer above.

The loaded pallets are taken from the machine on a 200-foot pan-conveyor which parallels a long row of curing racks with a capacity of 32,000 shingles. Two men remove the pallets and tiles to these racks where they are left to cure for 12 hours. Curtains are drawn over the racks and the steam is turned on.

Two other men return the cured tiles on their pallets to the pan-conveyor. Near the end of the conveyor the tiles are removed from the pallets, which are placed on the bottom strand of the conveyor and returned to the machine where they are automatically cleaned and sprayed with oil. The tiles are put in small racks on a short Link-Belt 2-strand cable-conveyor, which carries them through a long tank of water for a final soaking before they are removed to outdoor storage. The 900- by 800-foot asphalt concrete outdoor storage yard has space for 2½ million shingles and about 1½ million are usually on hand. There is also space for the equivalent of a million full-sized blocks. The large storage capacity not only insures proper curing but also, Mr. Streblow believes, is a good advertisement for the products.

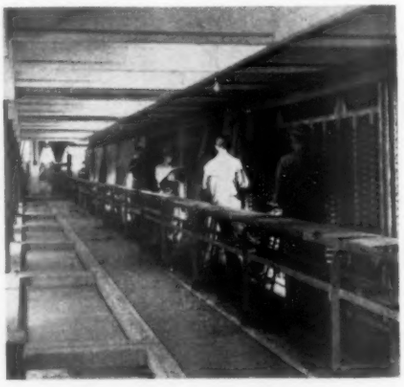
One of the truck-mixers being loaded.

View showing some of the many types of blocks in storage.

Special Spanish-type ridge roof tiles and angle ridge and third-round ridge tiles are made by hand. Colors for all the tiles and shingles made are ground and mixed in a small ball-mill. A wide range of colors and shades is available. One of the most popular is a weathered shade of gray black.

Wherever possible the company recommends the standard specifications for concrete unit construction issued by the Portland Cement Association and those for wall construction developed by the Masonry Association of California for the Federal Housing Authority. The company developed an 8- by 8-inch composite reinforced beam for lintels and finds that these are 80 per cent. as strong as solid reinforced concrete. A block split lengthwise is also made so that plumbing can be installed more economically. A saw with a traveling table has been devised to cut the standard shapes of blocks into specials, eliminating the necessity for a large stock of molds. This saw is also used for cutting tiles and shingles.

Most standard sizes of blocks are made and 1½-inch veneer units are made in the same sizes. A block 12 inches thick, 8 inches high and 12 or 24 inches long is also made. Another unusual product is a 3-cell filler unit for concrete floors. Units of this type are made in 6-, 8-, 10- and 12-inch depths. Laid side by side they form a flush celling with a good plaster bond.



Cured shingles being placed on conveyor.

A rack-load of blocks being carried away from one of the machines by a gasoline lift truck.

Hard concrete poured over these units and in reinforced grooves between them form the beams and floor slab.

All the blocks are sold by square feet of wall area and their prices are about in line with those in most other sections of the country. The mix used approximates 4 sacks of cement per cubic yard of concrete and the strengths obtained exceed the A.S.T.M. requirement of 700 pounds per square inch of gross area. A standard 8- by 8- by 16-inch block weighs about 30 pounds.

The company maintains a completely-equipped laboratory to keep a constant check on its products and the ingredients used in them. This is in charge of Frank Riordan, who has had long

(*Continued on page 86*)

Special Vibration Machines Producing Huge Rip-Rap Units for Kingsley Dam

A block being deposited on a rack by the overhead hoist. Lift truck is at right and block machine at left.

ONE of the most interesting concrete-products manufacturing operations it has been the writer's privilege to visit is that of the A. H. Read Company near Ogallala, Nebraska. This company, which has for 30 years been in the highway and municipal paving field, was awarded a contract for nearly a million concrete rip-rip blocks to be used in facing an area of 77 acres on the up-stream side of the Kingsley Dam on the North Platte River about seven miles north of Ogallala and 175 miles east of Cheyenne, Wyoming. This dam, now near completion, is a PWA project being erected by the Central Nebraska Public Power & Irrigation District for the irrigation of and power for the North Platte River valley, and is said to be the second largest earth-fill dam in existence. It is 3 miles long and 50 feet wide at the crest and 187 feet high. A core of impervious clay is backed up on each side with a hydraulic fill of Platte River gravel. The company's contract, amounting to over a million dollars, includes laying the blocks in place on the dam.

For years engineers have wanted to use a scientifically designed pre-cast rip-rip unit with its desirable ribs, bosses and cores. Such have often been specified as an alternate to the usual natural rock, but the high cost of casting the concrete units by hand in forms on a floor always resulted in the use of rock. It remained for the progressive A. H. Read Company to collaborate with the Stearns Manufacturing Company and develop a machine-made concrete rip-rap unit that could be produced at a cost which was not prohibitive.

The concrete units are specially designed shapes 4½ feet long and 9 to 9½ inches thick. They are made in 12-, 15- and 18-inch depths for use on different levels. The smallest units weigh about 270 pounds each, the 15-inch units weigh 370 pounds and the large units 470 pounds. The specifications called for—and the mix was designed for—a compressive strength of 3,000 p.s.i. but regular and frequent tests have shown all units to run in excess of 3,800 p.s.i. This high strength is attributed to good factory practice and the effective process of molding. Absorption averages about 2 per cent. or 5 per cent. less than the maximum permitted and density averages 3 per cent. under the maximum permitted.

Manufacturing operations were begun in August, 1939 and 700,000 units had been made and stored before laying of the blocks began in September, 1940. The filling of the dam has now been completed and laying of the blocks will continue well into 1941.

The aggregates used are sand and gravel up to ¾ inches in size, and these are supplied from a plant on the South Platte River a few miles south of Ogallala. A contract for producing a total of about 125,000 cubic yards has been let to a subcontractor. Bulk cement is received in cars at a siding in Ogallala, where it is unloaded by a Fuller-Kinyon portable unloader to a Butler storage bin. A truck with a special wind-and water-proof steel body hauls the cement to the plant. A special pneumatic system conveys the cement to plant bins and an elevator feeds the aggregates into bins. A fine blow sand dug from nearby hills is also stored.

By W. E. TRAUFFER

One-cubic yard traveling weigh batchers with Fairbanks scales on a track under the bins are used to batch aggregates and cement into the four Stearns 1-cubic yard batch mixers serving 4-cubic yard feeder chutes over the two block machines. Water is metered into the mixers, heated water being used when necessary. The use of two mixers to each machine insures a steady supply of concrete. The mixture used

Two blocks ready to be laid in place on the upstream face of the dam. One of the dredge pipes used to make the fill is in background.

A close-up of one of the two special vibrating block machines used in this plant. Off-bearing hoist is at left.

consists of 1920 pounds of ¾-inch minus gravel, 1510 pounds of river sand, 105 pounds of blow sand and 470 pounds of cement. To this mixture is added 28.75 gallons of water or 5.75 gallons per sack of cement. Mixing time is not less than 6 minutes per batch.

The two Stearns Joltcrete block machines were made specially for this job and together have made 2,300 units in

Crane unloading two blocks at once at the dam.

8 hours. The record 8-hour production for one machine has been 1,440 of the 12-inch blocks. Rated capacity for that size is 960 blocks. The blocks are made on master pallets, two pallets being used with each machine. After the blocks are stripped out of the mold box they are picked up by a turn-over off-bearer. A flat steel pallet is then clamped on the top of the block which is then turned over and the offbearer is run backwards over a table where the block is released. The block on its flat pallet is then picked up by a Chisholm-Moore ½-horsepower overhead electric hoist and loaded on steel racks holding 12 units each. A Clark gasoline Tructractor and several Barrett-Cravens lift trucks are used to haul away the racks.

The blocks are first stored in seven curing rooms with a combined capacity of about 5,000 units. There they are cured in cold weather with a combination fog, live steam, and radiated-heat process. The temperature in these rooms is held at about 110 deg. F. In the summer only fog curing is employed as the sun provides ample heat. The blocks are kept in these rooms from 8 to 24 hours, depending on conditions.

Three Clark gasoline power lift trucks are used to transfer the blocks after initial curing to outdoor storage. The blocks are lifted from the racks by a crane with special hooks and stacked

This view shows the special hook used to lift the blocks.

in rows. The blocks are then further sprinkled for 48 hours to insure proper curing, after which they are allowed to age a minimum of 28 days. Blocks are not removed from the curing rooms when outside temperatures are less than 40 degrees F.

The completely-cured blocks are loaded on flat rack trucks which haul them the 1½ miles to the dam. Cranes with special hooks lift them from the trucks two at a time and lay them in place on a specially-prepared layer of earth. Steel rods ⅜ inches in diameter are then strung through the core openings and welded together forming continuous reinforcement from top to bottom of the dam. All core openings and other openings are then filled with gravel by a hydraulic method. About 85 men are employed on the rip-rap job.

Basalite

(from page 84)

experience with this type of work. An unusual item of equipment is a miniature rotary kiln which is used for test purposes.

Low-pressure steam for curing is supplied by a horizontal locomotive-type boiler. There is also a high-pressure boiler for quick curing and for testing cylinders. An Ingersoll-Rand Type 30 tank-mounted compressor supplies air for cleaning the machinery and other purposes.

The history of the Basalt Rock Company might be called typical of the growth of the State of California. It was formed 19 years ago to operate a small crushed-stone plant. Later the quarry was developed to produce rip-rap. Eight years ago the Russian River Gravel Compaany at Healdsburg was taken over and a new 300-ton per hour all concrete-and-steel plant was built. The original rock plant at Napa had by this time been enlarged to a capacity of 250 tons per hour and a small pumicite plant was built at a deposit near the company's quarry. Six years ago the company took over the John Casseretta Company, which had a material yard in San Francisco. A ready-mixed-concrete plant was built and is operated under that name. When the new products plant was built ready-mixed concrete was batched there and more recently a plant was installed at Flosden to serve Vallejo and the Mare Island Navy Yard.

Sponsor Concrete School

The Ready-Mixed Concrete Manufacturers Association of Pittsburgh sponsored a school for concrete mixermen, batcher operators and truck-mixer operators recently.

The school was conducted for two evenings at the Hotel Roosevelt by R. S. Phillips, technician of the structural bureau, Portland Cement Association.

Furnishes Concrete for New University Buildings

IN the city of Bloomington, Indiana, home of Indiana University, is located one of the best concrete batching plants in any city of 20,000 population. This plant is one of the latest ventures of Ralph Rogers, who also operates the Ralph Rogers Company, the Louisville Crushed Stone Company, and the Road Resurfacing Company, producers of crushed stone and road contractors. Mr. Rogers also is one of the leading highway contractors in this section and operates several portable plants to supply materials for his contracts.

Mr. Rogers had worked around crushed stone plants since he was 12 and about 35 years ago went into this business on a partner-ship basis. About 15 years ago he built his first permanent plant which burned down before it went into operation. This plant was immediately rebuilt and was operated until a few years ago, when it again burned down. Instead of rebuilding on the same site, Mr. Rogers built a plant at a new location near Bloomington. On the old plant site he later erected the concrete plant.

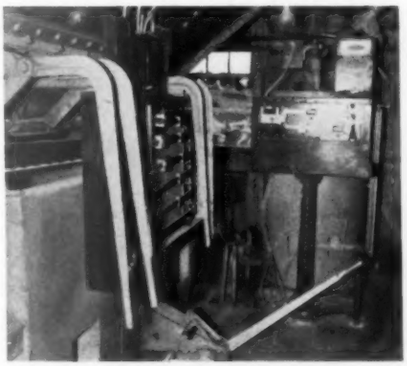
This plant was built just in time to supply the concrete for a $7,000,000 building program at the university. This work, now near completion, consists of seven new buildings, including three dormitories. One building, the Hall of Music, alone required 6,000 cubic yards of concrete. Private building has also absorbed much of the output of the plant and will be the major outlet for future business.

The sand and gravel used in this plant are received by railway and crushed stone is trucked from the plant already mentioned. Aggregates are discharged into a 25-cubic yard track hopper from which a Link-Belt reciprocating plate feeder supplies the 100-ton per hour Link-Belt chain-bucket elevator. A selective gate and chutes control the discharge of the materials into the four 70-ton compartments of the Blaw-Knox steel bin. Two compartments are used for sand and the other two for ½- to 1-inch gravel. Crushed stone is used only in concrete for highway construction.

Bulk cement is received in special bottom-discharge cars and is dropped into a small hopper. A Link-Belt screw-conveyor and a bucket-elevator feed the cement into a 300-barrel Blaw-Knox bin in which air-jets keep the cement from arching. The inclined screw-feeder supplying the cement compartment of the common batcher is 10 inches in diameter and 18 feet long and is driven by a Master 7½-horsepower gearmotor controlled by a push-button switch.

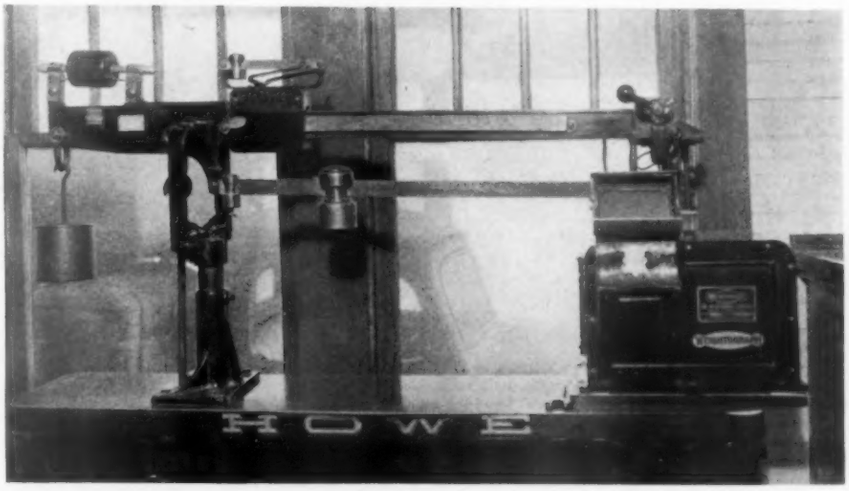
Each of the four aggregate compartments has a lever-controlled clamshell gate from which aggregates are discharged into two compartments of the Blaw-Knox batcher. Weighing is done by a Winslow 5-beam scale with an indicating dial. Gravel is weighed first, then cement, and then sand. Truck-mixers are loaded through a lever-operated gate.

The mixing water is pumped from the old quarry into a 750-gallon storage tank. It flows by gravity into a 125-gallon Blaw-Knox tank equipped with a Fairbanks 2-beam scale. The feed is cut off at the desired point by a G. E. solenoid connected to a Davis globe valve. The gallonage is checked on a water glass. Any excess water can overflow and there are outlets to allow draining the pipe and the main tank. Both batchers are equipped for weight checking. For winter operation a Brownell 731-square foot, 100-pound



The water- and aggregate-and-cement weighing batchers.

One of the truck-mixers being loaded under the plant.



The truck scale used to weigh out aggregate shipments. Attached is quick-reading device.

boiler is used for heating the water in the main tank. The aggregates are heated by 3 tiers of 2-inch steam pipes in each bin.

Concrete is delivered in five Blaw-Knox 1½-cubic yard mixers which actually mix and haul 2 cubic yards of concrete. They are mounted on Ford V-8 chassis provided with Ruxton rear axles and overload springs. Goodyear tires are used. A load of concrete can be turned out every three minutes and 135 cubic yards has been delivered by this fleet in 6 hours on a 2½-mile haul.

At the plant there is a sacked-cement storage shed with a capacity of several carloads. The cement is usually sold direct but some high-early-strength cement is stored for use in concrete.

There is also a main office with an air-conditioned private office and bookkeeper's room. A Howe scale and Weightograph in this building are used to weigh all shipments of aggregates made from the plant or yard.

Aggregates are received at the company's yard by trains or trucks. A Barber-Greene portable conveyor feeds a Barber-Greene stock-piling conveyor. A Baber-Greene loader is used for loading from stock-piles into trucks for shipment. This yard is also used to store contractors' equipment. A well-equipped repair shop is maintained.

The central-mixing plant of the Campbell Coal Company.

56-Year Old Atlanta Concern Adds Central-Mixed Cement

THE CAMPBELL COAL COMpany, Atlanta, Georgia, one of the oldest and largest coal and building-material dealers in the South, recently went into the production of central-mixed concrete in order to protect its aggregate outlets and to fill out its line. All the materials used in the construction of a building can now be supplied with the exception of the plumbing. This company was founded in 1884 to deal in coal. Aggregates, cement and lime were soon added. The company now operates 10 yards in Atlanta, one in Decatur and one in East Point, both suburbs. Erection of the new plant was begun in October, 1939 and it was in operation early in January, 1940. The plant was designed by the Blaw-Knox Company, which supplied much of the equipment. Its location at the company's Foundry Street yard is within a few blocks of the main business section and is in one of the main manufacturing districts of the city. Most of the residential construction is within from 3 to 5 miles of this plant.

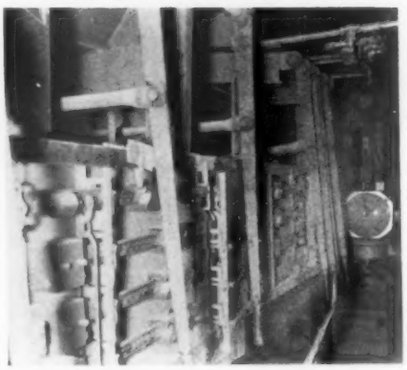
The plant is alongside the Southern Railway tracks, which are on a fill at this point. Crushed granite and sand are brought in on a sidetrack laid on a trestle in hopper-bottom cars from which they are discharged into seven bins under the trestle. About 1,000 tons of stone and 600 tons of sand can be stored. Stone is used in two sizes, 1-inch minus and ¾-inch minus.

Aggregates are reclaimed individually through drop-chute gates to a 24-inch by 480-foot horizontal belt-conveyor. A 25-foot cross belt-conveyor, driven by chain from the tail pulley of the first conveyor, feeds the material to the 24-inch by 480-foot inclined belt-conveyor running to the top of the plant. Link-Belt conveyors and Goodyear belts are used. A revolving spout, controlled by a cable from the batching floor, feeds the four 55-ton compartments of the Blaw-Knox cylindrical steel bin. One compartment is used for sand, one for ¾-inch stone and the other two for 1-inch stone.

The bulk cement used in this plant is received in box-cars on the siding and is unloaded by two men with hand scrapers who handle a 200-barrel car in 4 hours. A Link-Belt bucket-elevator is followed by a short screw-conveyor, and selective gates and chutes feed four bin compartments holding 200 barrels each. These gates are controlled by a cable from the batching floor.

The Blaw-Knox cement-weighing batcher is fed through Blaw-Knox rotary valves under each bin compartment. It is equipped with a single-beam scale and indicator.

A part of the fleet of twelve truck-mixers operated by the Campbell Coal Company.



The aggregate and cement batchers and water meter.

Aggregates are fed through lever-operated clam-shell gates into a Blaw-Knox weighing batcher with a scale having separate beams for each aggregate.

Water is obtained from city mains and is measured by a Neptune meter with a Jenkins automatic shut-off valve.

Aggregates and cement are discharged from their batchers through a chute into the Koehring 56S concrete mixer. A gate in the chute makes it possible to load direct into the truck-mixers for mixing in transit. Some dry-batched materials are also loaded out in this way.

The company started out with a fleet of twelve Jaeger mixers mounted on 6 International and 6 GMC chassis. Ordinarily used as 2-cubic yard agitators, these machines can also be used as 1½-cubic yard mixers. All are equipped with water tanks. A truck can be loaded and on its way in 2 minutes and 350 cubic yards can easily be produced in an 8-hour day on medium-length hauls.

The concrete manufactured is used mainly for private construction. Some is also used for state highway bridges and similar work. The largest projects supplied to the date of this writing are the John Hope and John Eagan Negro housing projects which cost over a million dollars each.

All in Readiness for Chicago Conventions

Speakers from all parts of the United States, representing every branch of the concrete industry, are included on the programs of the several conventions of concrete men to be held in Chicago, February 10-12, in connection with the Concrete Industries Exposition.

To cover the many important subjects clamoring for attention during the three days available, and to give as many opportunities for discussion as possible to the thousands of concrete men expected to attend, a series of open forum sessions have been planned in addition to the more formal type of meetings. In these sessions, discussion leaders, selected in advance for their practical experience with the subject, will give a series of 10-minute talks, each of which will be followed by five minutes of general discussion from the participating group. This method is expected to produce a wider range of views on each subject and allow more men to take active part in the meetings.

Convention sessions will be held in the mornings, with the afternoons and early evenings left open for committee meetings and attendance at the Concrete Industries Exposition. More than 60 manufacturers of concrete industry equipment and materials will exhibit their products at this Show. Included in these exhibits will be the various new models of concrete products machinery, bins and batchers, stationary, portable and truck types of mixers, pumps, vibrators, lift trucks, portable electric saws and other power tools, surface finishers, in fact practically every type of equipment used by concrete contractors, concrete products manufacturers, and ready-mixed concrete operators. In addition to machinery, a wide line of concrete forming devices and construction accessories and materials used in the production of modern concrete will be exhibited. Concrete men will find more to interest them at this Show than in any previous year as many exhibitors will show a wider line of equipment than ever before.

• Automatic Block Machine

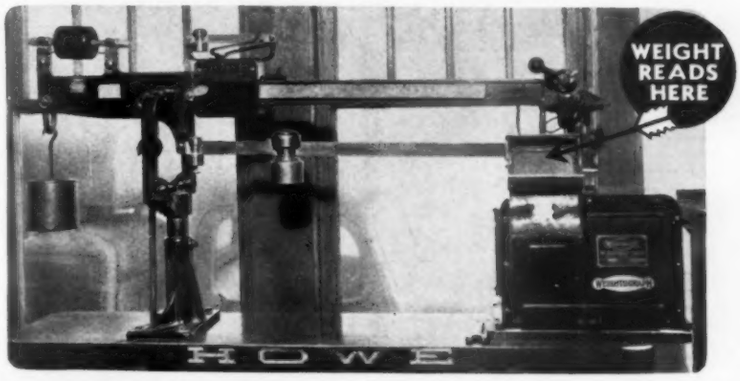
The Kent Machine Company, Cuyahoga Falls, Ohio, has brought out a new automatic block machine using the vital principles employed in the Kent-Root Vibra-Press. The machine, however, is more automatic in its action and is so designed that it makes a multiple of blocks at one cycle of the machine. It uses a combination of vibration and press to give the desired results. The principles of floating mold box and floating cores are employed, giving the same fine texture and homogeneous content as was produced on the original Vibra Press, yet it has the advantages over this previous machine by its being fully automatic in its action and having hydraulic in place of mechanical power.

AT THE MODERN PLANT OF READY-MIXED CONCRETE CO.

(See article in this magazine)

Instant Accurate Weight

is assured by this Howe Equipment



HOWE WEIGHTOGRAPH

Saves money by speedy weighing. No waiting. No hand balancing. No questions. Load a weightograph equipped scale, and FLASH! Correct weight shows in large, clear figures, easy to read 30 feet away. Weightograph can be attached to any make of beam scale or scale convertible to beam operation. An optional built-in feature of modern Howe beam scales.

HOWE MOTOR TRUCK SCALES

The simplest, sturdiest built. Levers alone in the 20 ton model are heavier than other makes of scales *complete.* Ball bearings cushion platform shocks, guard accurate knife edges. Built for years of accurate service at lowest operating cost. Ask to see cutaway diagram of Howe Truck scales before installing new weighing equipment.

Write today for newest literature on Howe Scales for Aggregate Plants

The HOWE SCALE Company

102 SCALE AVE., RUTLAND, VERMONT

ONE Machine for ALL Size Pipe

Cut your costs of concrete pipe production by using the same machine for all sizes from 6" to 60".

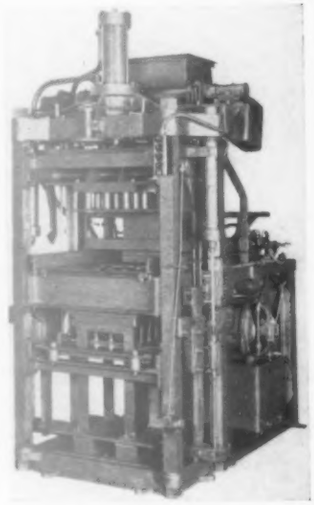
Universal "all purpose" concrete pipe machine produces quality pipe at lowest cost, because it requires smaller investment, insures greater footage per bag of cement, and more pipe per man.

Start the concrete pipe business with Universal equipment, and you will be sure of maximum profits.

Write for Bulletin

UNIVERSAL CONCRETE PIPE CO.
Columbus Ohio

Precision Production of Concrete Blocks

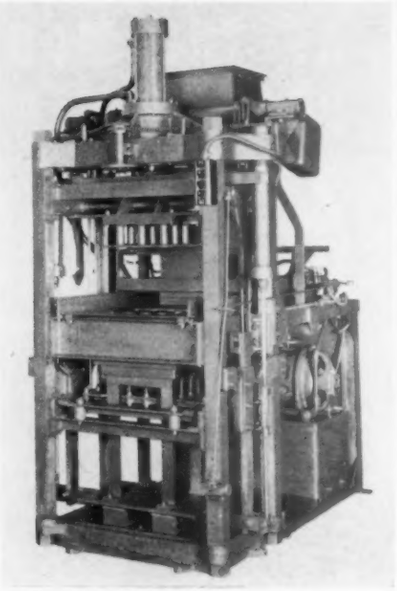


KENT HYDRAULIC VIBRA PRESS

VIBRATION-PRESSING

2 to 4 Blocks per cycle

KENT MACHINE CO.
Cuyahoga Falls, Ohio



The new automatic machine.

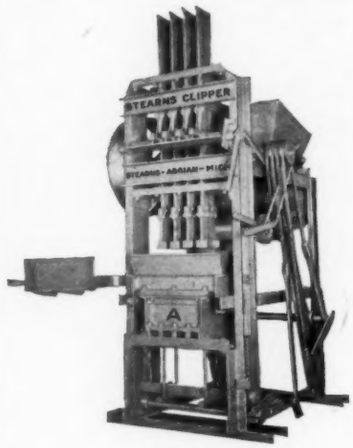
The control of the machine is very simple and easy after the pallet is dropped into the mold box. The operator pulls lightly on a small handle which starts the cycle. The feed box then automatically moves forward by hydraulic power from its location under the loading hopper to a position directly over the mold box. At this point the vibration begins and the material enters the mold box under this action and the vibration continues packing the material in the entire mold box. The feed box then recedes cutting off the charge in the mold box at a predetermined distance or "fill" above the required height of the block and the press head immediately descends under hydraulic pressure.

As the press head enters the mold box the cores and mold box are allowed to float down thereby allowing the aggregate in the mold box to be packed without outside resistance, resulting in a block of uniform density. When the press head meets the resistance of packing the block, the pressure in the cylinder builds up until the cross head reaches a stop to give the exact height of block required. This stop is adjustable to bring any height of block required which is a very desirable feature. All blocks will be exactly the same dimensions after the stop is set for the desired height. After the block has been pressed to height the cross head and press plate return to the high position and with this action the block is stripped from the mold box ready to be taken away by the off-bearer.

A mechanical off-bearer is furnished with the machine if desired or the blocks may be taken off by the operator. The capacity of the Hydraulic Vibra Press is two 12-inch or 8-inch, four 6-inch, 4-inch, or 3-inch blocks at one cycle of the machine and operates equally well on either the heavy or light-weight aggregate.

The features of this machine are its automatic hydraulic action, a floating mold box and cores, and adjustable fill for mold box, making conditions adaptable to all types of aggregate and consistency of mix. The resultant blocks are absolutely true to dimension, with beautiful corners, fine texture and uniform density.

The Kingston Trap Rock Company of Kingston, New Jersey, recently added five new Jaeger truck-mixers to its fleet. The new units are of 4 and 5 cubic yards capacity.



The Clipper Stripper, shown above, available in 5 models, is only one of the popular machines in the ANCHOR Line of Complete Equipment for the Concrete Products Plant. ANCHOR Engineering Service in the design of new plants or revamping older operations is nationally famous. Consult us before you buy equipment or modernize your plant . . . it costs no more.

Hobbs block machines, Anchor tampers, Anchor, Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager Columbus, Ohio

LESS DEAD WEIGHT

COMMERCIAL CORED STEEL PALLETS ARE LIGHTER IN WEIGHT

In one day's production of two thousand 8" blocks, the plain pallet user handles approximately 108,000 pounds more pallet weight than the cored pressed steel pallet user and 88,000 pounds more pallet weight than the cored cast iron pallet user. Or equivalent in human effort to handling two carloads of material—*every day!*

THE COMMERCIAL SHEARING AND STAMPING CO.
YOUNGSTOWN, OHIO

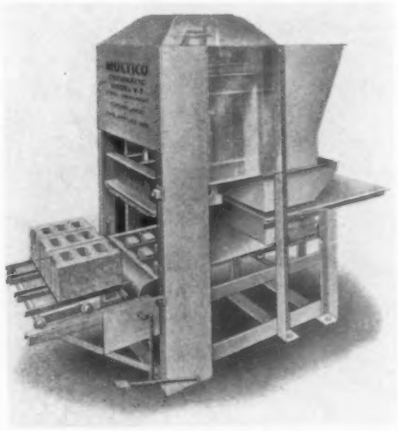
• Block Machine

The Multiplex Concrete Machinery Company, Elmore, Ohio is introducing its newest block machine to the concrete-products industry at the conventions and equipment exhibit to be held at the Hotel Sherman February 10-12.

The new machine, the culmination of 37 years experience in the making of block machinery, is known as the Multico Vibrator, and vibration, tamping and pressure are employed to produce units with any kind of aggregate of uniform density and texture. It will be supplied in three sizes to make either one, two, or three units at one operation. The operating cycle is push-button controlled. The largest of the machines is capable of producing 12 standard blocks per minute.

An outstanding feature of the Multico Vibrator is that it can be operated either by electric power or by compressed air. Tamping is accomplished by a series of air cylinders and the action can be regulated by a control valve to deliver a light or heavy blow. This feature is important especially when lightweight units are being manufactured, as too heavy a blow from the tampers may injure the cellular structure of the aggregate. Vibration, imparted either electrically or by air pressure, is also under control of the operator. All units are given a true pressed-top finish.

According to the manufacturer, the use of the pneumatic system has allowed the elimination of a great many cams, gears, sprockets



This machine operates either by compressed air or electricity.

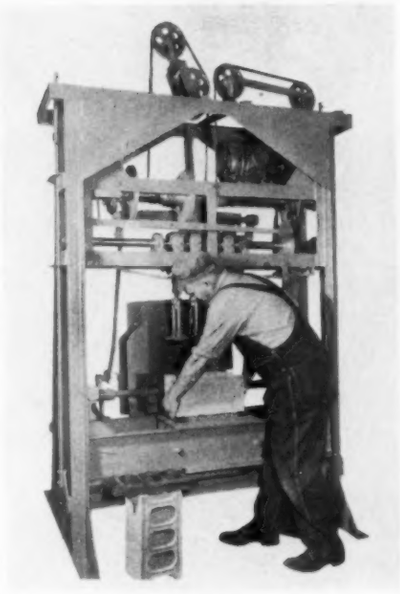
and other parts subject to wear, assuring a long-lasting machine which will require little maintenance.

A new type ventilated flue block for round, vitrified liners is also being offered by Multiplex. Attachments available allow its production on existing standard Multiplex Model E machines.

• New Tamper

A stir of interest is reported in the concrete industries over the announcement of a new block machine bearing the name of "Kramer." Kramer tampers have been familiar to block manufacturers for more than 35 years. Many recall the early and ingenious block tamper engineering of the late G. W. Kramer. In his first factory at Peoria, Illinois, he produced power tampers which were prominent in the market for years.

The new Kramer Pak-Crete machine, according to the Kramer Corporation of Peoria, embodies all the features of the earlier Kramer machines, plus new, noteworthy improvements. Most important of these are: Compact, one-piece welded frame built with greatly increased strength; cable lift for cage; additional



A new block machine with an old, well-known name.

lubrication fittings; greater simplicity and ease of operation than formerly; and much increased performance life.

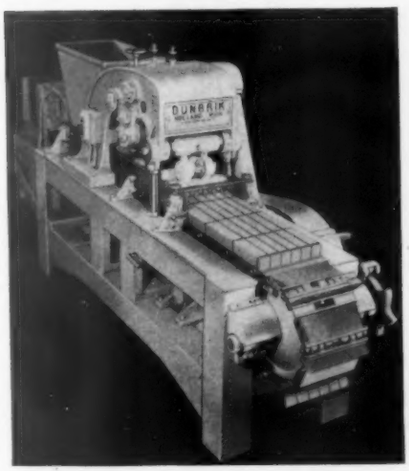
At the Concrete Industries Exposition in Chicago, February 10-12, display models of the new Kramer Pak-Crete machine will be prominently on view.

• Combination Machine

The Concrete Pipe Machinery Company of Sioux City, Iowa calls attention to its "Five-In-One" machine which enables the manufacture to supply four important markets in addition to turning sewer-pipe specials into a profitable side line

This machine, the maker claims, will put the products manufacturer in the sewer-pipe business, the block business, the drain-tile business, and the underground power conduit business. It will also help him make "Y" and "T" sewer-pipe specials.

It will be on display at the Chicago convention, February 10-12, at the Hotel Sherman.



Following its policy of designing equipment for versatility and usefulness, the W. E. Dunn Manufacturing Company announces another forward step in its Dunbrik machine. This latest improvement enables the user to make veneering brick at a production speed of 24,000 per day. Thus it is now possible to manufacture a total of 18 sizes, besides the standard brick, on this machine.

• Self-Contained Unit

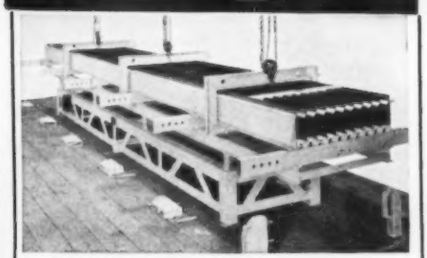
A new Korpak stripper block machine is being offered by the Concrete Equipment Company, Holland, Michigan. This new machine is an entirely self-contained unit consisting of mold box, power-driven feeder and oscillating cores. Its designers took particular care to

Machine with finished block removed.

provide a machine that would be easy to operate and maintain. Change of sizes is quickly accomplished by merely hanging in a new mold box and cores.

It produces true, accurate tops by automatically troweling them. This feature also permits the use of a wetter mix than average.

KIRK & BLUM



STEEL FORMS
***for* Concrete Joists**

These forms are made in standard 20-ft. lengths. Also special lengths to meet individual requirements. The illustration above shows method of removing complete set of poured joists, which permits multiple production where desirable or feasible.

HEAVY DUTY VIBRATING TABLES can be furnished

We manufacture Sewer Forms—Curb and Gutter Forms—Steel Concrete Forms of all Kinds. Write for details—no obligation.

THE KIRK & BLUM MFG. CO.
2818 Spring Grove Avenue
Cincinnati • Ohio

No Wonder Jaeger OUTSELL ALL OTHER

12 Years of EVER-INCREASING LEADERSHIP Culminate in These 1941 Models — THE COMPLETE

CHECK LIST

EXCLUSIVE FEATURES THAT EXPLAIN JAEGER'S EVER GROWING LEADERSHIP

(A) ON BOTH "LOW-CHARGE" AND "HIGH DUMP" UNITS

1. "DUAL-MIX" END-TO-END MIXING WITH THROW-BACK REVERSING BLADES, producing higher strength, more workable concrete.
2. FASTER MIXING AND DISCHARGE of either high or low slump material.
3. QUICK ACTING CHARGING AND INSPECTION DOOR—Can take full batch in one drop through the top.
4. DUAL REVOLVING WATER SPRAYS —100% faster, spray uniformly from end to end of drum.
5. SYPHO-METER WATER TANK, accurate within ½% of tank capacity.
6. "UNI-VALVE" CONTROL of mix, tempering and flush water.
7. "WINTER SAFETY" WATER BOOSTER.
8. TWO-SPEED SHOCK-PROOF TRANSMISSION for long or short hauls or agitation.
9. VACUUM CAB-CONTROLLED TRUCK ENGINE DRIVE or SEPARATE ENGINE DRIVE.
10. COMPACTNESS—2 Yd. size can be mounted on Ford-type trucks.
11. COR-TEN STEEL (both corrosion and rust resisting) and highest type Automotive Construction throughout, insuring lowest maintenance costs.

(B) ON "HIGH DUMP" UNITS ONLY

1. "SURE-SEAL" models to meet rigid specifications, with
2. AIR-TIGHT VACUUM-CONTROLLED DISCHARGE DOOR
3. "DUAL-LOADERS" equipped for both top and end loading to meet different conditions, with
4. LEAK-PROOF CHARGING-DISCHARGING HOPPER

3 Yd. Standard "LOW CHARGE" Model

2 Yd. "SURE-SEAL" HIGH DUMP Model on Ford-Type Truck

JAEGER PORTABLE HOPPER

Keeps Your Truck Mixers Moving— Means 25% More Payloads per Day on Average Job

Tows to job with the first truck mixer load, takes 2 or 3 yd. batches at a time, permits mixers to return immediately. One hopper serves a big job. A few keep average fleet busy. Get our low price.

MORE CONCRETE IS SOLD BY JAEGER TRUCK MIXERS

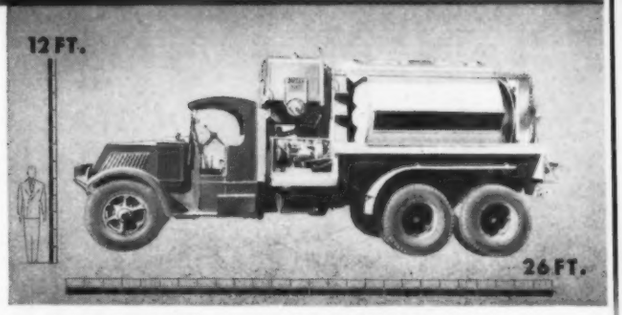
Truck Mixers, Agitators MAKES COMBINED!

Since Jaeger Pioneered the MODERN Truck Mixer, ANSWER TO TODAY'S READY-MIX DEMANDS

Standard LOW CHARGE TRUCK MIXERS, AGITATORS in 2 to 8 Yd. Sizes

Offered in 6 improved models—lowest to load (thus saving on bin equipment), fastest to mix and discharge any slump concrete, and equipped with larger "Dual-Mix" drums which take the payload capacity of modern trucks. In addition, many exclusive Jaeger operating features shorten the payload trip, increase the number of daily payloads, achieve maximum daily production of higher strength concrete.

Buy wisely—see "Check List" at left—it shows why these units are the overwhelming choice of operators who do steady, big volume business.



JAEGER BUILDS WORLD'S BIGGEST TRUCK MIXER FLEET FOR NEW YORK CITY OPERATORS:

Over 160 Units, in Sizes Up to 8 Cu. Yds., equipped with Jaeger Truck Engine Drive, Vacuum Controlled from Cab, Unanimously Chosen by Nine New York Operators to Modernize Their Plants. Jaegers were Selected after Comparison with All Makes. Steady Repeat Orders Have Followed Original Purchase.

HIGH DUMP TRUCK MIXERS, AGITATORS

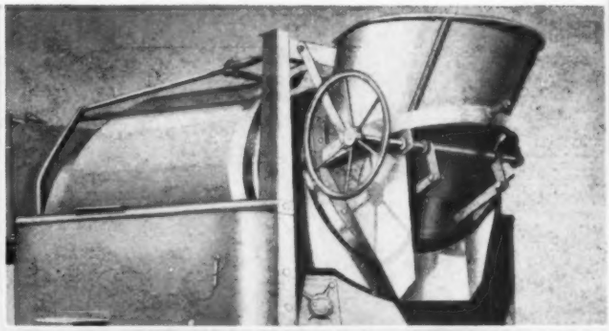
2 to 5 Yd. Sizes, Offered in Two Types to Meet Every Condition

(A) "SURE-SEAL" MODELS with Top-Loading and Inspection Door and Vacuum-Controlled Discharge Door, Giving Air-Tight Drum.

(B) "DUAL-LOADING" MODELS Equipped with Both End Loading Hopper and Top-Loading and Inspection Door.

Only Jaeger offers you truck mixers that combine high discharge with the ability to meet every specification and demand. Have all the proven features that have made Jaeger the acknowledged leader—bigger sizes of Dual-Mix Drums with Throw-Back Reversing Blades insuring higher strength concrete—fastest of their type to mix and discharge low slump material—Two-Speeds for long or short hauls or agitation—Shock-Proof Transmission with Vacuum Cab-Controlled Truck Engine Drive or Separate Engine — "Winter-Safety" Water Booster and Dual Revolving Sprays—Compactness to mount on Ford-type trucks.

Buy wisely—see "Check List"—it shows why Jaeger HIGH DUMP is outselling all other high discharge types.



ONLY JAEGER OFFERS "DUAL-LOADING" WITH END CHARGING-DISCHARGING HOPPER

When equipped with Jaeger Leak-Proof Charging-Discharging Hopper, HIGH DUMP Truck Mixers can be either end-loaded or top-loaded, as desired. For fastest charging and rigid specifications, drum will take full rated batch in one drop through Top Door. For bigger drum load, requiring additional mixing, drum can be end-loaded through Hopper. Hopper discharges through slide gate, retains tight seal with drum at all times.

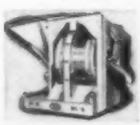
ALL JAEGERS ARE EQUIPPED WITH TOP DOOR FOR INSPECTION OR LOADING WHEN DESIRED.

JAEGER AUTO-PAVERS WITH JAEGER SCREW SPREADER

The mobile paving plant of today — easily equals 34E Paver output with substantial reduction of costs and improvement in slab. Used in numerous States, growing in popularity. Get Catalog TMP-41.

PUMPS FOR GRAVEL WASHING AND DRAINAGE

World's largest selling pumps of their kind. Combine 100% automatic priming with high centrifugal efficiency. Meet any demand up to 240,000 G.P.H. Cut costs. Ask for catalog and prices.



MIXERS TO 56S SIZE

Most complete and largest selling line in world.

"TOUCH CONTROL" HOISTS to 100 H. P.

Most advanced design, finger-tip control.

"EASY DUMP" CARTS to 11 CU. FT.

Save Truck Mixers waiting on jobs. Ask for prices.

GET THESE 1941 FACTS FOR READY-MIX PRODUCERS—MAIL TODAY!

New Data, Specifications, Prices, Terms—Just Off the Press. Check Information Wanted and Mail Slip

THE JAEGER MACHINE COMPANY
602 Dublin Avenue, Columbus, Ohio

Send us complete 1941 plant data covering: ☐ Standard LOW-CHARGE Truck Mixers, Agitators. ☐ HIGH DUMP Truck Mixers, Agitators. ☐ Portable Hoppers, ☐ Auto Pavers and Spreaders. ☐ Pumps. ☐ Mixers, ☐ Hoists. ☐ Carts.

Name_____

Address_____

AND AGITATORS THAN BY ANY OTHER METHOD

The CONCRETE MANUFACTURER

Here's what you'll be doing—

AT THE

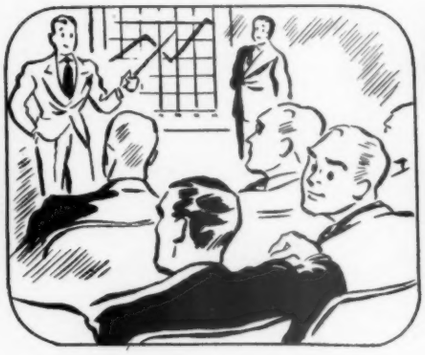
CONCRETE INDUSTRIES EXPOSITION

MEET OLD FRIENDS—the fellows who have been in the business with you for a long time—the fellows with many a valuable "tip" that hits close to your pocketbook. Here's a chance to get together with your customers—as well as competitors!

MAKE NEW FRIENDS—you can't have too many! Here you'll meet men who will be valuable business contacts as well as congenial company. Don't forget there'll be several thousand present—men whose business and social interests are the same as yours.

SEE THE LATEST. See the machines, materials, and methods that will make news in 1941! See the biggest array of cost-saving, profit-making machines for the concrete industries ever placed under one roof.

HEAR THE NEWEST in merchandising—in production—in construction—in research! Those after-dinner chats you'll have with men who know, will be invaluable to you in carrying a strong business policy to a successful conclusion in 1941.



ATTEND OPEN FORUMS. Be on the spot when the biggest men in the industry "argue it out" in intimate, vitally interesting open forum meetings where issues fundamental to your success will be discussed.

GET THE 1941 ANGLE. There are countless new "angles" which will be revealed and analyzed at the Concrete Industries Exposition. Get the "low-down" on them as they point directly to your success or failure to make a profit in 1941.

THIS IS YOUR SHOW—BE THERE! Concrete contractors, concrete products and ready-mix men, home builders interested in the fast growing use of concrete and concrete products—general contractors, engineers and public officials—this is your show! Plan to attend!

COME... SEE HOW IT'S DONE IN '41

CONCRETE INDUSTRIES EXPOSITION

CHICAGO

FEB. 10-11-12

HOTEL SHERMAN

Annual Conventions of the

National Concrete Masonry Ass'n.
American Concrete Contractors Ass'n.
National Cinder Concrete Products Ass'n.
Cast Stone Institute
American Concrete Pipe Ass'n.
Illinois Builders League

to be held concurrently with the Concrete Industries Exposition.

The Answer to High Quality Concrete

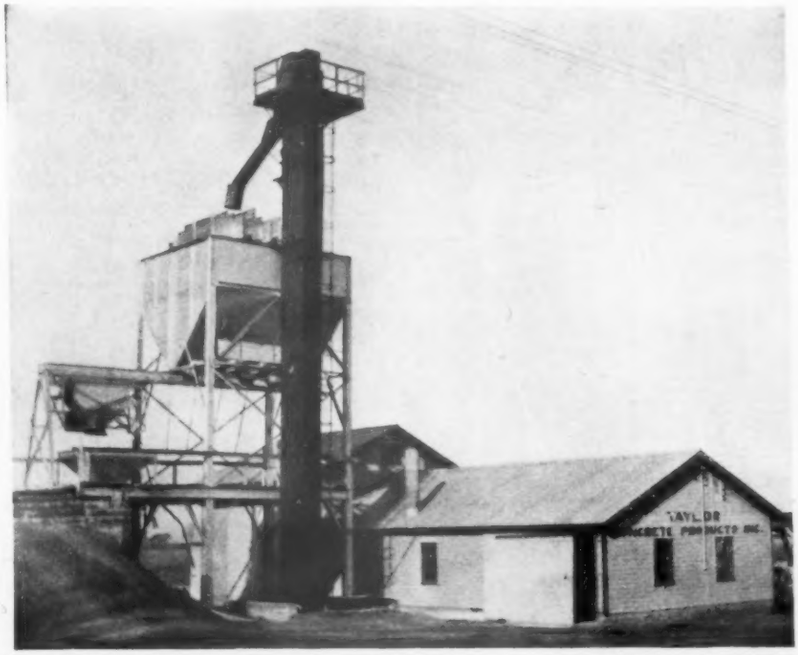
Ransome Truck Mixers and Agitators

Many exclusive time and money saving features make Ransome Truck Mixers a profit-making investment. Write for new bulletin.

RANSOME CONCRETE MACHINERY COMPANY
DUNELLEN, NEW JERSEY

Engineered by BUTLER

Your guarantee of finest performance and highest quality



Combination ready-mix and concrete products plant. Traveling weighing batcher serves both batch mixer and truck mixers.

Ready-mix concrete plant with bucket elevators for aggregate and bulk cement.

Why not let Butler engineers plan *your* plant to greatest advantage? Our engineering service carries no obligation.

BUTLER BIN COMPANY
Waukesha, Wis.

The CONCRETE MANUFACTURER

QUINN PIPE FORMS

HAND or WET PROCESS

Make concrete pipe on the job with *Quinn Pipe Forms.* Quinn Pipe Forms can be handled by less experienced labor and produce uniform concrete pipe of highest quality. The recognized standard of all concrete pipe.

HEAVY DUTY CONCRETE PIPE FORMS

Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe — any length. Backed by years of service in the hands of contractors, municipal departments and pipe manufacturers.

NEW MEDIUM DUTY CONCRETE PIPE FORMS

Meet the demand for low cost equipment that produces a uniform quality of pipe in smaller amounts. Complete in every way. Stands up on any job. Same sizes as "Heavy Duty," from 12 to 84 inches—any length.

Write Today

Get complete information on prices and Special Construction features of Quinn Pipe Forms. Give us size of job for estimate on your pipe form needs.
Also manufacturers of concrete pipe machines for making pipe by machine process.

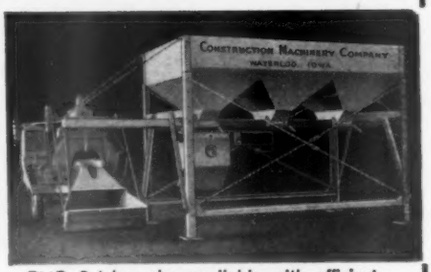
QUINN WIRE & IRON WORKS
1627 TWELFTH ST., BOONE, IOWA

IT'S THE NEW BIN BATCHER

• • •

CUTS COSTS IN PRODUCTS AND PIPE-MAKING PLANTS

An unbeatable concrete producing setup with CMC 10S or 14S mixer. Speed and uniform accuracy of batcher are features that appeal to products plant operators. Bins can be extended to give greatest storage capacity or trolley, scale and weight hopper available as a unit to those who wish to build their own bins.



CMC Batcher also available with efficient auxiliary elevator and receiving hopper.

Get CMC Big New Equipment Catalog. See the Newest in Concrete Mixers in all sizes. Also Hoe Type with No. 6 Wonder, a new outfit with belt pulley for brick, tile, block and general products plants. See the latest in Hoists, Pumps, Power Saws, Carts.

Don't miss the CMC Exhibit. Hotel Sherman, at the Concrete Industries Exhibition.

CONSTRUCTION MACHINERY COMPANY
WATERLOO, IOWA

BARRETT LIFT-TRUCKS

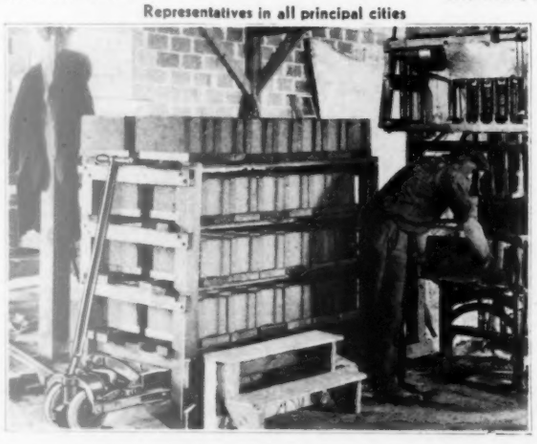
ONE MAN HANDLES 48 BLOCKS NO BREAKAGE

Available for fifteen days free trial without obligating you to buy.

Handle your green concrete products the way that more than 800 other concrete products plants do, WITH BARRETT LIFT-TRUCKS EQUIPPED WITH A SUPER-SPRING FRAME AND RUBBER TIRES. Eliminate breakage—jogging out of shape and spoilage. Save time, money and labor by eliminating all unnecessary handling and breakage. Take your blocks direct from the machine to the curing room—with ease and dispatch. One man handles 48 blocks of the 8x8x16 size—or, 32 blocks of the 8x12x16 size.

Write for illustrated circular.

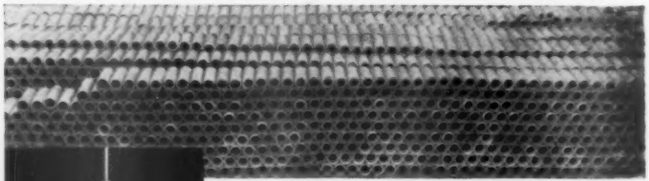
BARRETT-CRAVENS COMPANY
3251 West 30th Street CHICAGO, ILL.
Representatives in all principal cities

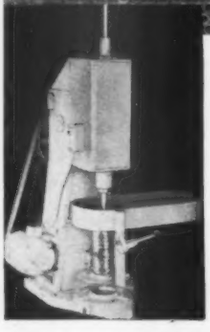


This is one of SHERMAN'S Ball Bearing Concrete Pipe Machines, showing Sectional Core and Jacket. The Economical Machine of the Day.

Write for Prices and Information.

SHERMAN CONCRETE PIPE CO.
KNOXVILLE, TENN.





MAKE DRAIN TILE. Big 4-way market. Farm drainage — building foundations — new and old road drainage—suburban and farm home sanitation systems.

BIG PROFIT MARGIN. Material and labor costs approximately 30c per rod of tile. Sells for 40c to 80c. Machine capacity 10 rods per hour. New Champion Machine simple, easy to operate. Shipped on 15 days' trial.

INVESTIGATE. Write today. Learn about the profit possibilities for you with this machine.

CONCRETE EQUIPMENT COMPANY
530 Ottawa Ave. Holland, Mich.

Where Can I Cut Production Costs?

Does the "5 in 1" Fit Into the Defense Program?

How Can I Meet Competition Away From Home?

THE CORRECT ANSWERS TO YOUR 1941 CONCRETE QUIZ

How Can I Solve the Transportation Problem?

Is There a Profitable Market in a Small Town?

Has the Small Operator a Chance?

Is There a Portable Concrete Pipe Machine?

Will Sizes 4 to 36 Inch Meet Every Demand for Machine-Made Pipe?

CONCRETE INDUSTRIES EXPOSITION
CHICAGO FEB. 10-11-12
Booth L-76

MODEL "T" CONCRETE MACHINE

The Model T Roller-Head Machine makes the pipe Bell-End up, and uses Dual Packer-Heads. The Roller-Head packs the pipe barrel and the Inverted Bell-Packer packs the socket.

This Machine has a range of sizes, 4 to 36 inch. It is our contention that these are the only sizes that should be machine-made. Larger than 36 inch the local market is small and the Transportation Factor is the controlling element. Therefore, a few Hand-Molds will complete your size range, and you can make them on the job site.

"McCracken" pipe made by the Roller-Head process and cured on Pallets presents 9 economy features which results in additional profits:

(1) Makes longer lengths.
(2) Permits thinner walls.
(3) Permits a wetter mix.
(4) Improved hydrostatic results.
(5) No distortion in shape.
(6) Use more coarse aggregate.
(7) Requires less cement.
(8) Save ½ steel-elliptical cages.
(9) Makes real profits on small sizes—4" to 12" are volume sizes.

The Model "T" Machine affords maximum flexibility—4, 6, or 9 man crew practical and efficient. All three production cycles result in saving labor costs per foot of pipe. Consequently can handle double the market with half the pipe in the storage yard—less fixed investment.

A Portable Machine is available to plants using the Packer-Head process. This feature eliminates transportation cost and permits bidding on jobs 100 or more miles away from your plant.

For complete information and prices, ask for illustrated literature on Model T Machine.

"FIVE IN ONE" CONCRETE MACHINE

The "Five-In-One" Machine is the most versatile machine ever offered the cement products industry. If you are a pipe manufacturer using the "Tamp Process," this will complete your line and enable you to serve new and important markets.

So-named because it makes:

(1) Building Block for external, basement, and partition walls as well as floor and roofing tile.
(2) Sewer Pipe, sizes 4" to 18".
(3) Drain Tile, 12" or 18" lengths (Two Units at a time).
(4) Wye & Tee Branches for Sewer Pipe Specials.
(5) Underground Single Square Conduit for Power Lines.

Building Block: 8"x8"x48" with "Siding Face" gives superior external appearance and saves Stucco or any other veneer. 6"x6"x48" Block used for floors, and 4"x4"x48" Block for partition walls. Half Blocks make Roofing Tile of four types—all attractive.

Sewer Pipe: Best known Sewer Pipe in small sizes. Used by 45 domestic and 25 foreign manufacturers.

Drain Tile: Machine without extra Attachments make Drain Tile at new low cost range. Important additional market for small town manufacturer—sizes 4" to 18".

Wye & Tee Specials: A headache turned into profits.

Conduit: Fastly taking the place of Fiber Conduit because the latter has to be encased in a concrete envelop.

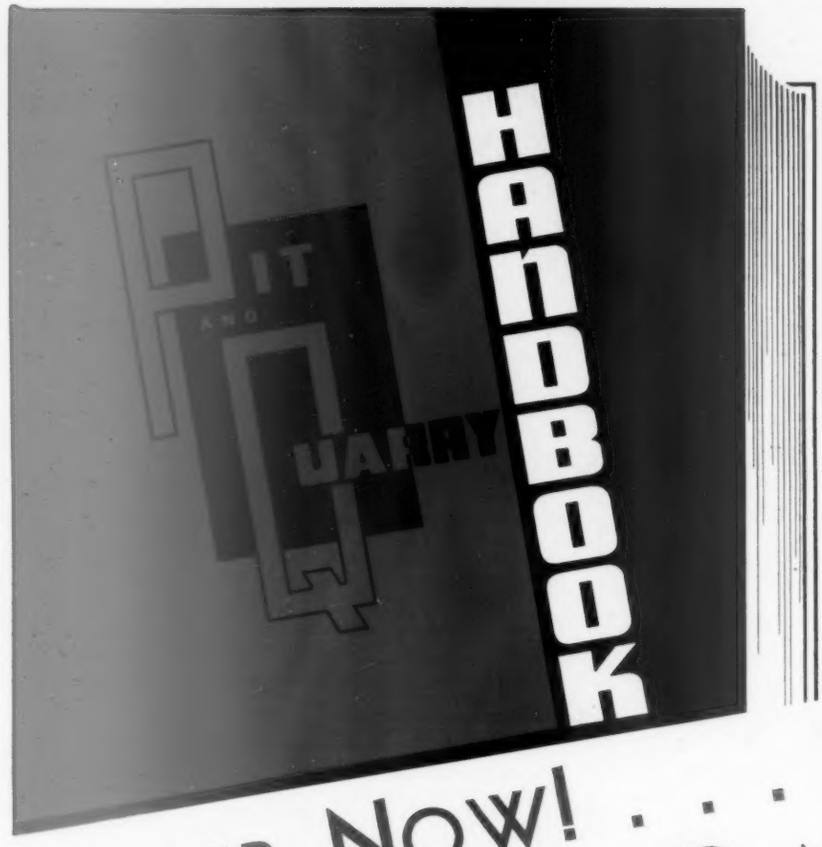
The trend is away from frame construction—fireproof construction is taking its place. We ask all Lumber Yards and Building Supply Dealers in towns of 5,000 and up to investigate. We believe this offers an ideal way for you to participate in this trend.

Write for complete information and price of this Machine.

McCRACKEN PIPE
Corrugated

CONCRETE PIPE MACHINERY CO.
SIOUX CITY IOWA U. S. A.

The CONCRETE MANUFACTURER



- **Complete, accurate and up-to-the-minute Directory.**
- **Hundreds of new names; others checked and revised.**
- **Alphabetical by companies; geographical by plants.**
- **Consolidated catalogs of equipment makers.**
- **Revised and improved technical section.**

ORDER NOW! . . . YOUR 1941 MAILING LIST . . . READY 10 DAYS

Don't Waste Your Time and Postage on an Old List

The compilers of the 1941 Directory Section of Pit and Quarry Handbook have labored painstakingly to build an accurate list of all known American producers of nonmetallic minerals. Each new listing has been carefully scrutinized for accuracy and completeness. Previous listings have been revised, checked, double-checked. All appear two ways—(1) alphabetical by companies, (2) geographical by plants. It gives you company names, officers, location of plants, size or capacity, and names of the men who do the buying. Select the complete Handbook and Directory, or the convenient, flexibly-bound Directory alone. Now ready for distribution. Order NOW to insure getting one of the first copies. Use coupon below . . . we'll bill you after you get the book.

Pit and Quarry, Date.....

538 S. Clark St., Chicago, Ill.

Please send.....copies of the 1941 HANDBOOK ($10.00 per copy)

Please send.....copies of the 1941 DIRECTORY ($10.00 per copy)

☐ Check enclosed.....

☐ Send Invoice with book

Name ..... Title.....

Company .....

Town ..... State.....

Step Ahead in 41
WITH THESE
LINE PRODUCTION MACHINES

ANALYZE YOUR PRESENT BUSINESS—every department—then plan for 1941. Ask yourself: Am I making the products offering the biggest return per dollar invested? Am I securing satisfactory sales volume, profit margin, and what about the future?

NOW, CONSIDER DUNBRIK-DUNSTONE line production machine which has proven a money maker the world over and has opened up new and profitable markets. It produces highest quality DUNBRIK at the rate of 32 per minute in 40 beautiful colors, shades and textures, all proven by more than 12 years of world wide actual use.

Write today for free book "4 Keys to Success". It also tells how 18 different sizes of DUNSTONE are made; of authorized manufacturers reporting costs as low as $5.00 per thousand, and others with sales up to four and one-half million DUNBRIK per year.

THEN CONSIDER DUNTEX ROOF AND FLOOR TILE Machine making the most beautiful roof material in the world at lowest cost. With this machine you can supply your market with three types of DUNTEX Roof Tile and Floor Tile in full range of beautiful colors. Send today for DUNTEX Roof Tile booklets and see for yourself the possibilities this machine offers you in your territory.

MAKE LITH-I-BAR JOISTS on this line production machine in sizes 6" to 14" and up to 32 feet in length, with capacity up to 600 feet per hour. Wherever manufactured, Lith-I-Bar is being specified for all types of buildings. Already recognized the country over, and additional manufacturers are now wanted to supply this biggest and most profitable market. Write for complete Lith-I-Bar book and learn how one manufacturer's sales exceeded $300,000 in a single year; another, one order of more than 51 miles of Lith-I-Bar Joists.

FOR FURTHER INFORMATION
SEE OUR CATALOG IN SWEET'S

YOU OWE IT TO YOUR BUSINESS—to your future—to investigate these three line production machines, all making trademarked products and all furnished with territorial franchise protection. Write today, while your territory is still open. Also plan to visit our exhibit at the Concrete Industries Exposition and arrange to visit a Chicago Plant, where equipment can be seen in actual operation.

W. E. DUNN MFG. CO.

420 W. 24TH ST. HOLLAND, MICH.

The CONCRETE MANUFACTURER

MONARCH CONCRETE STAVE MACHINE OPENS UP A VAST FIELD OF . . .

PROFITS

The time-proved design and rugged construction built into the Monarch Stave Machine mean sensational performance as hundreds of experienced operators testify. Features many improvements over previous model, assuring greater production and finer stave quality.

The new ventilated steel crib stave, developed by the Monarch Company has entirely new field for the stave manufacturer and more than doubled the production of many plants.

Concrete Silo and Crib staves make an ideal product to add to any building material line. It will be profitable for you to investigate.

See our display at Concrete Industries Exposition. For information, write

MONARCH MACHINE & STAMPING CO.
DES MOINES · IOWA

Miles CONCRETE EQUIPMENT

SIMPLE AS A-B-C

Miles Equipment does not require the services of an expert mechanic. Anyone without previous mechanical experience can keep a Miles machine in perfect operating condition.

Write for Catalog

The Miles Manufacturing Company
Dept. 2, Jackson, Michigan

SEVEN MATERIALS IN ONE BIN?

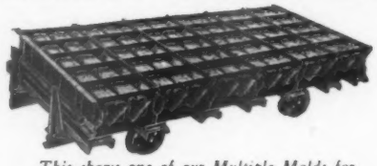
"You Bet—this new BLAW-KNOX plant accurately measures and loads aggregates, cement, and water into truck mixers."

Blaw-Knox Truck Mixer Loading Plants include overhead storage bins for aggregates and cement; accurate Weighing Batchers for aggregates, cement and water; arranged for manual or automatic operation; complete conveyors for handling materials from cars or trucks to bins, when desired—all properly designed and built to your requirements as an efficient unit for truck mixer loading. See Blaw-Knox Catalog No. 1582.

15

BLAW-KNOX BLAW-KNOX DIVISION · OF BLAW-KNOX CO. · Farmers Bank Bldg. · Pittsburgh, Pa.
TRUCK MIXER
LOADING PLANTS

START A NEW BUSINESS



This shows one of our Multiple Molds for casting 8x8x16" concrete blocks. We manufacture a complete line of Multiple Molds for blocks (both Rockface and plain), for brick, veneer blocks, etc. We are also owner and originator of the ZAGELMEYER SYSTEM of granite veneer for blocks.

Make **ZAGELMEYER** *Waterproof Concrete Blocks*

A Start May Be Made With as Little as $500.00

The Zagelmeyer System produces a block that no other system can equal. Many good territories open. Write today for further information.

BAY CITY CAST STONE BLOCK COMPANY
Successor to Zagelmeyer Cast Stone Block Machinery Company
502 S. Henry St. BAY CITY, MICH.

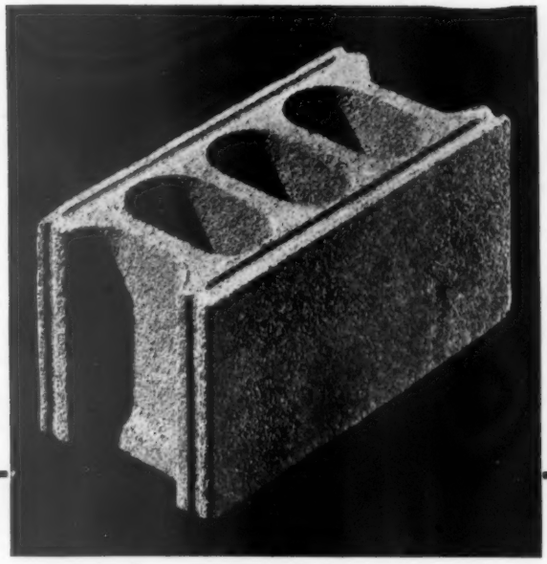
HOTEL PHILADELPHIAN
FORMERLY HOTEL PENNSYLVANIA

DANIEL CRAWFORD, Jr., Manager
39th and CHESTNUT STREETS
PHILADELPHIA, PENNA.

Our courteous and competent staff will give you the utmost in friendliness, comfort and service. Conveniently located to all stations, and only five minutes away from the heart of the business section.

600 ROOMS each with bath from $2.50 up

Lounge and Restaurants. Unrestricted Parking to 3 a.m.



To the Joltcrete Operators of America

February 1, 1941.

For four years your number has been growing. Each of you, in your local community, has pioneered a new and better building product—a masonry unit produced by a new and novel method of vibration—controlled vibration under pressure.

Today, when your number has well passed the hundred mark, we want to thank you for your support and your faith because you have shared with us the responsibilities and the rewards of the pioneers.

We feel a moral responsibility to protect you, as completely as possible, from unfair and infringing competition. We are keeping faith, though you must understand that in the interest of justice to all, the prosecution of patent litigation proceeds carefully and deliberately.

The suit in the U. S. District Court in the Southern District of New York is scheduled for early trial. Other suits against alleged infringers of the broad Joltcrete patents await the determination of the above action.

In the meantime, this office is at the service of all Joltcrete owners. Let us know what we can do to forward our mutual interests.

Yours for a Prosperous 1941,

Louis Gelbman
Inventor

One Good SMITH-MOBILE Deserves Another!

The first Smith-Mobile purchased by Pennsylvania Supply Co. two years ago.

More Repeat Orders are Pouring in Daily

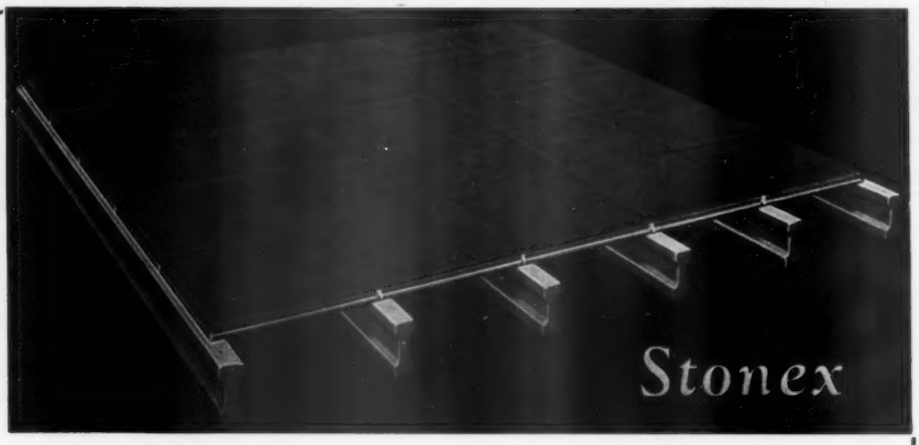
Ready-Mixed Operators everywhere are clamoring for more Smith-Mobiles. Why? Because they have had the opportunity to put this dependable machine through its paces. They KNOW from their own practical experience that Smith-Mobile meets every modern truck mixer requirement. They KNOW it's the ORIGINAL HIGH DISCHARGE truck mixer, thoroughly field-tested and backed by the world's leading concrete mixer manufacturer. So don't take chances on new and untried truck mixers. At least, investigate Smith-Mobile. 4 sizes available—2 cu. yds. to 5 cu. yds. as truck mixers—(2½ cu. yds. to 6 cu. yds. as agitators). Write for catalog 198-A.

THE T. L. SMITH COMPANY
2887 N. 32nd STREET • MILWAUKEE, WISCONSIN

Today's fleet of Smith-Mobiles owned by the Pennsylvania Supply Company. Satisfactory performances prompted the company to acquire additional Smith-Mobiles when more units were needed.

THE Modern TRUCK MIXER and AGITATOR

HERE'S A NEW LOW-COST CONCRETE FLOOR



Here is a practical answer to the question "How can we get a good low-cost, finished concrete floor?

Precast concrete joists open the door to the low-cost floor market. STONEX clinches the sale by solving the problem of a floor finish.

The illustration above shows how simple the tile are to place . . . the speed with which a floor can be completed . . . the distinctive result that is obtained, at an amazingly low cost.

The new and exclusive STONEX process enables products manufacturers to produce—at low cost—tile of all shapes, sizes, and for all purposes . . . tile that are harder than granite, as proved by laboratory tests . . . in beautiful colors; all shades, tones and blends, that are an integral part of the tile itself.

The system has been perfected and proved by test and job experience. It is all ready for alert products manufacturers to merchandise. It is just what you need to win your local floor business.

Write today for more details about STONEX process and our plan to license manufacturers to make and sell this system

STONEX INDUSTRIES, 210 Seventy-First Street, Miami Beach, Florida

MULTICO

PNEUMATIC VIBRATOR TAMP PRESS

. . . Making Its Premier Showing

This Sensational New Development in Concrete Block Machinery . . .

after long research by Multiplex Engineers . . . . will make its premier showing at the

CONCRETE INDUSTRIES EXPOSITION

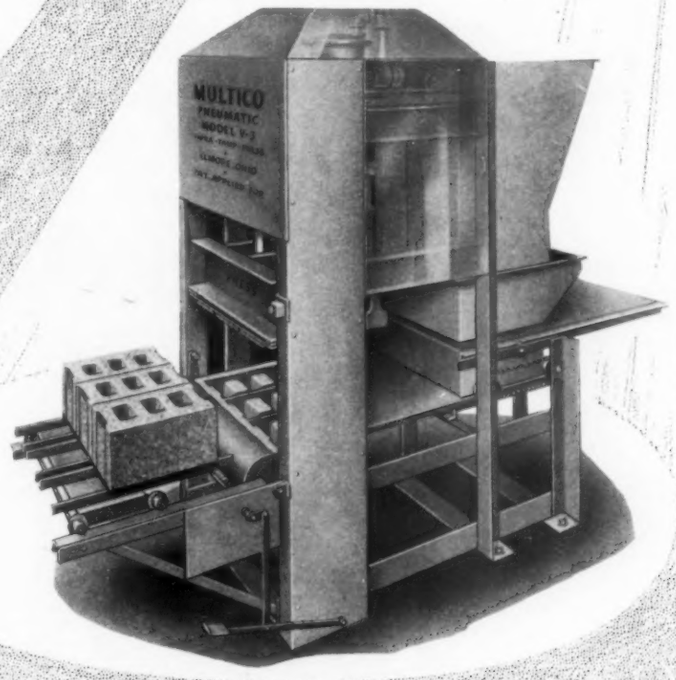
MULTIPLEX BOOTHS:

Nos. 43-44-45-46 and 47

Be sure to see MULTICO 3-in-1 Combination Unit, convertible into a Tamper, a Press or a Vibrator and Press. Its demonstration will be a feature of the Concrete Show in Chicago, February 10, 11, 12.

We'll be seeing you!

Frank Muenzer
Pres. and Gen. Mgr.



THE MULTIPLEX CONCRETE MACHINERY CO.

ELMORE, OHIO

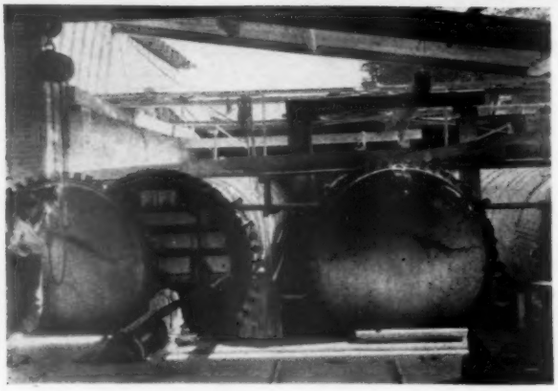
The CONCRETE MANUFACTURER

Lay Your Own PROFIT FOUNDATIONS in 1941 with a JACKSON & CHURCH Concrete Brick Machine

Piling bricks from mold to car. Runs 3,000 per hour.

BETTER BRICK AT LOWER COST

because produced under approximately 150 tons pressure by the Jackson & Church Press, insuring uniform texture and density . . . sharp edges and corners . . . record high output and unequalled low costs. Both faces finished alike . . . no lost time in sorting or laying. With these advantages, you can profitably compete with clay brick in quality and economy.



High Pressure Steam Curing

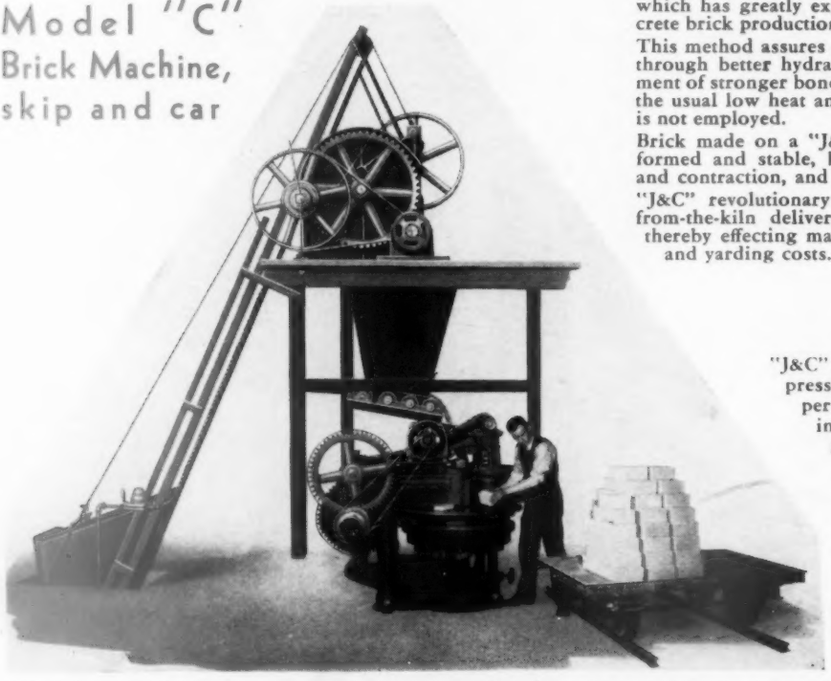
"J&C" pioneered and developed high pressure steam curing, which has greatly expanded the profit possibilities in concrete brick production.

This method assures a higher strength unit for a given mix through better hydration of the cement, plus the development of stronger bonding agents than can be obtained under the usual low heat and moisture conditions where pressure is not employed.

Brick made on a "J&C" Press are light-colored, perfectly formed and stable, being practically free from expansion and contraction, and from future internal disruptive action.

"J&C" revolutionary steam curing means speedy, direct-from-the-kiln delivery, without yard stocking or aging, thereby effecting material savings in stock pile investment and yarding costs.

Model "C" Brick Machine, skip and car



Making Concrete Brick on the Model "C" Machine. Available in capacities to suit your requirements.

"J&C" Presses mould perfect brick under high pressure at capacities of 1300 to 1500 units per hour for Model "C" machines. They insure maximum strength and density per mix of aggregate. NO PALLETS are used, as brick is taken direct from machine and stacked. Bricks can be colored in the mix, or sprayed later.

Write for Information

SINCE 1881

JACKSON & CHURCH CO.
SAGINAW, MICH.

Wire went to work for mankind

when John A. Roebling made America's first wire rope - 100 years ago!

Over 100 years ago John A. Roebling made America's first wire rope. Wire alone had been a useful but feeble servant of mankind. But, now, wire really went to work!

The first Roebling Wire Rope was used for hauling Pennsylvania Canal Boats up the Portage Railway. Then, came Roebling Cableways, installed in many countries to transport construction materials across streams and gorges—followed by the first suspension aqueduct for the old Pennsylvania Canal.

John A. Roebling's first wire rope has made possible many of our modern industrial and commercial achievements . . . great suspension bridges from coast to coast, from the "George Washington" between New York and New Jersey to the "Golden Gate" Suspension Bridge in San Francisco—high speed elevators for skyscrapers—oil well drilling—mechanized mining—modern highway building—and other accomplishments too numerous to mention.

Today, Roebling's "Forward March with Wire" encompasses not only wire rope but a great variety of other Roebling Wire Products including, in part, Electric Wires and Cables, Woven Wire Fabrics, Cold Rolled Steel Flat Wire, and many others.

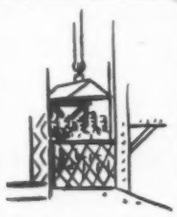
JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

Branches in principal cities

Export Division: 19 Rector Street, New York, N.Y., U. S. A. Cable Address: "Roebling's" New York

ELEVATOR ROPES—for applications ranging from private residence "lifts" to high speed skyscraper elevators.

AERIAL TRAMWAYS—for passengers, freight, etc., including Patented Constam Skilifts illustrated above.



MINING ROPES—for shaft elevators, steam shovels, drag scrapers, and other purposes.

MARINE ROPES—mooring lines, hawsers, hoisting rope, rigging, etc.

CONTROL CORD—for aeroplanes. Also guy wire, strand, fittings, and electric wire and cable.

FLAT WIRE—cold rolled high carbon steel flat wire for shoe shanks, clocksprings, heddles, etc.

ELECTRIC CABLES—over 60 types of electric wires and cables for every purpose.

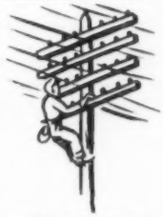
SHOVEL ROPES—wire ropes for excavating equipment, cranes, hoists, and other rope-rigged machinery.

OIL FIELD LINES—for rotary and cable tool drilling and every other oil field use.

STRIP STEEL—cold rolled high carbon "flats" for unending uses from steel measuring tapes to corset stays.

WOVEN WIRE FABRICS—from window screens to fine metallic filter cloth or coarsest mesh sizing screens.

MAGNET WIRE—for electric motor, generator, and coil windings. Insulation for every need.



TELEPHONE WIRE—bare galvanized, switchboard cable, twisted pair and parallel, etc.

DRAWN and ROLLED SHAPES—high or low carbon, for many uses including flexible shaft casings of dental equipment, miniature railroad tracks, etc.

1841 *FORWARD MARCH WITH WIRE* 1941

WIRE ROPE AND STRAND,—Preformed and Standard . . . FITTINGS . . . SUSPENSION BRIDGES AND CABLES . . . AERIAL WIRE ROPE SYSTEMS . . . COLD ROLLED STRIP ELECTRICAL WIRES AND CABLES . . . ROUND AND SHAPED WIRE . . . WIRE FORMS

WIRE CLOTH AND NETTING . . . STEEL AND COPPER RODS . . . HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS

Pit and Quarry Helps You Operate More Profitably

Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

To keep its readers fully informed, PIT AND QUARRY taps every source. Our field editors travel more than 30,000 miles a year to describe the processes and methods used by the outstanding plants making your type of product. Government activities affecting the field are interpreted so that you can better adjust your business to their regulations. Complete reports of all important conventions are published in PIT AND QUARRY. The new equipment and supplies which may make production more efficient are announced in each issue.

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It pays to know what you're really getting!

You don't have to "guess" when you choose a Bucyrus-Erie. Complete specifications published in fully illustrated bulletins covering each machine give you the facts — the same facts given to every prospect and customer. Complete crane ratings are shown, for example, together with information as to the basis on which the ratings are computed. You can count on obtaining, well within the machine's capacity, the performance indicated by Bucyrus-Erie's specifications. Performance you can count on lets you bid jobs at a price you can make money on.

Whenever you are in the market for shovel, dragline, crane, clamshell, dragshovel, skimmer, or piledriver, let us show you the story on what Bucyrus-Erie has to offer!

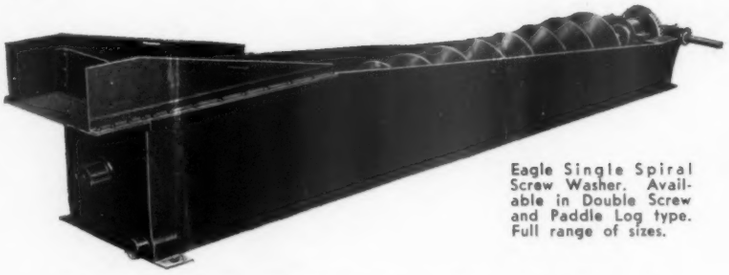
Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

"Two Wise Birds"

EAGLE WASHERS SPIRAL SCREW TYPE PADDLE LOG TYPE

He builds them for endurance!



Eagle Single Spiral Screw Washer. Available in Double Screw and Paddle Log type. Full range of sizes.

He chooses them for economy!

All experienced dredge operators know that there is no effective substitute for Eagle equipment. EAGLE also builds the famous "Swintek" Screen Nozzle Ladder.

"WE BOTH AGREE PERFECTLY!—You simply must have clean aggregate for good concrete."

That's where sand and gravel producers and commercial inspectors line up together. They also agree that material processed through EAGLE Washers will qualify for all specifications.

These machines are backed by many years of experience in designing, building and installation. Patented and exclusive features assure maximum output on an extremely low power and maintenance basis.

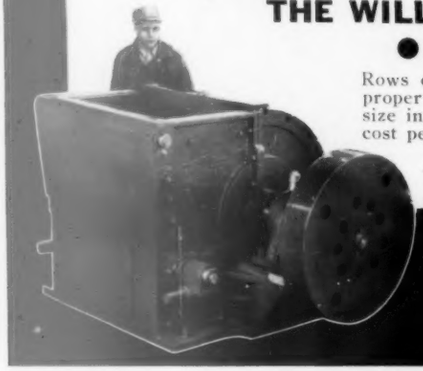
Write for our big Bulletin, which gives complete details about the EAGLE Line of profit-making machines, including Washers, Crushers, Grinders and Shale Planers.

EAGLE IRON WORKS **Des Moines, Iowa**

for Making 1¼", ¾" or Agricultural Limestone...

THE WILLIAMS "SLUGGER" CRUSHER AND PULVERIZER

● Handles Large Stone or Screen Rejects ●

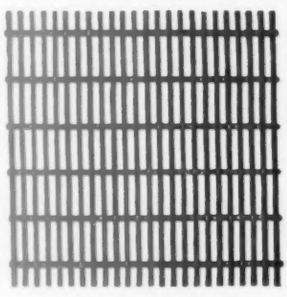


Rows of heavy, free swinging, fast revolving hammers, crush the material by impact until of proper size to pass through the grates. By reducing large rock to 1¼", ¾" or agricultural size in one operation, the "Slugger" has enabled operators to produce these sizes at a very low cost per ton and with small investment. Seven sizes—6 to 150 tons hourly capacity.

The Williams Patent Crusher and Pulverizer Co.
802 St. Louis Ave. **St. Louis, Mo.**

Williams
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
PATENT CRUSHERS GRINDERS SHREDDERS

AIR SEPARATORS
ROLLER MILLS
CRUSHERS
GRINDERS
SHREDDERS



Rolled Slot

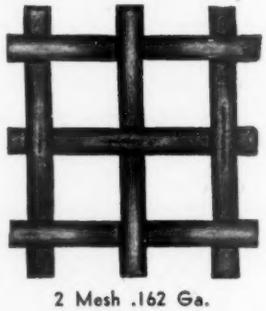
ALLOY No. 2

A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

THE CLEVELAND WIRE CLOTH & MFG. COMPANY
574 E. 78th St. **CLEVELAND, OHIO**

MANGANAL

TRADE MARK REG. U. S. PATENT OFFICE

WELDING ELECTRODES
(*Bare*, for D.C.; *Tite-Kote*, for A.C. or D.C.)

APPLICATOR BARS
(Round, square, flat or special shapes)

HOT ROLLED PLATES
(For patching and fabricating new parts)

CAST WEDGES BARS
(For repointing dipper teeth)

SEACO Hard Surfacing Electrodes are a recommended finishing layer over MANGANAL — allowing the underlying metal to work-harden for greater resistance to impact and abrasion.

RIGHT—MANGANAL Applicator Bars for repointing shovel dipper teeth.

STULZ-SICKLES CO.

SOLE PRODUCERS

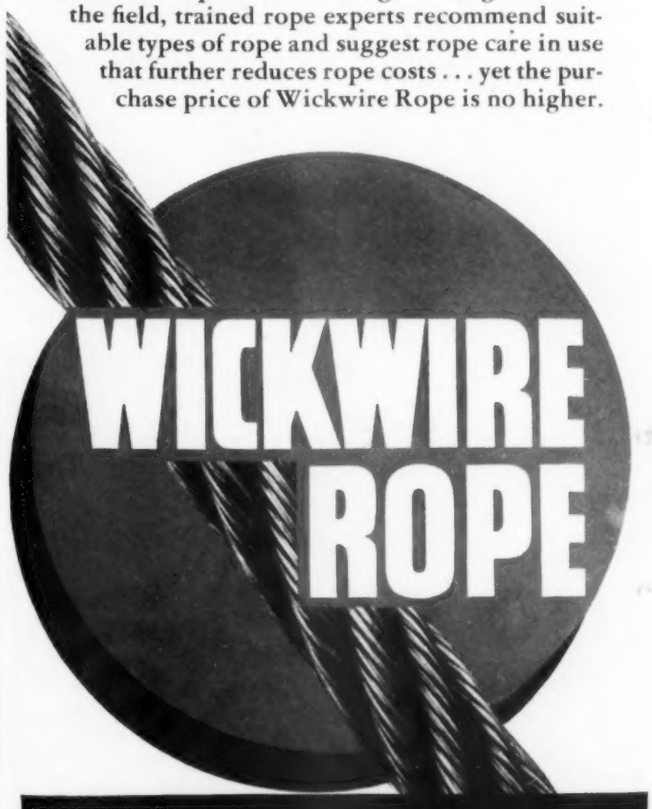
134-142 Lafayette St. Newark, N. J.

Write for Name of Nearest Distributor

DOES CHISELING PAY?

It depends upon where and how you chisel. If you devote your entire energies in shopping for price alone, you probably will find a "cheap" rope and still be the loser. If, however, you consider the per-unit-of-use cost, you are "chiseling" wisely and constructively.

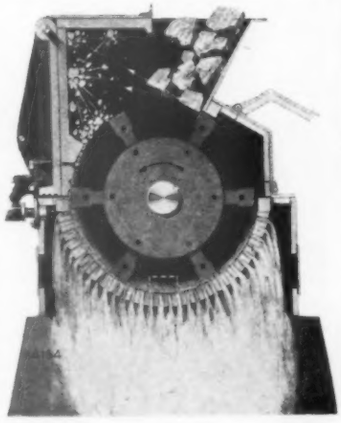
Wickwire Spencer offers every assistance to rope users in producing lower rope costs. In the laboratory and mill they develop and produce better metal and rope that in itself gives longer life. In the field, trained rope experts recommend suitable types of rope and suggest rope care in use that further reduces rope costs . . . yet the purchase price of Wickwire Rope is no higher.



WICKWIRE SPENCER STEEL COMPANY

General Offices: 500 Fifth Avenue, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

WHEN YOU THINK OF REDUCTION . . THINK of JEFFREY



If you want to produce a better product, and do it with less cost . . . we suggest you give Jeffrey Swing Hammer Pulverizers a try. They will give you dependable day-in and day-out service reducing limestone, shale, clay, chalk, marl, gypsum, phosphate rock and asbestos rock.

Patented

With a wide experience in reducing this class of material you can rely upon recommendations of Jeffrey engineers. A broad line . . . a broad service . . . reduction of material and operating costs. Write Jeffrey.

Reduction Division

THE JEFFREY MANUFACTURING COMPANY

917-99 North Fourth Street, Columbus, Ohio

For a Good Distributor

UNION WIRE ROPES

The "ULTIMATE LOW COST WIRE ROPE"

– Look For This Sign

The distributor for top quality wire ropes displays this sign. He is ready to help you select the rope best suited to your requirements—and secure recommendations from our Engineering Staff to save you money.

UNION WIRE ROPE CORPORATION
2132 Manchester Ave. Kansas City, Mo.
Tulsa • Houston • Chicago • Salt Lake City
New Orleans • Monahans • Portland • Ashland, Ky.

UNION Wire Ropes

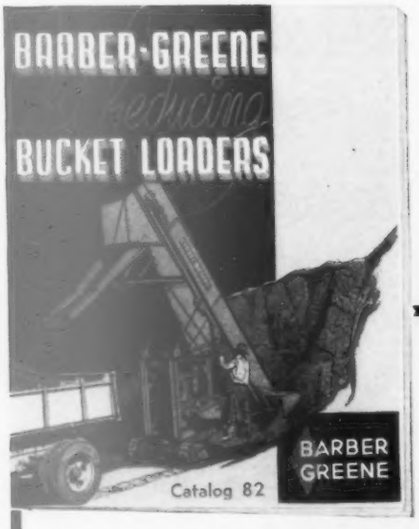
The "ULTIMATE LOW COST WIRE ROPE"

It's the "LAST MILE" for Rocks that enter the AMERICAN Crusher

Write for Information

AMERICAN Hammermills and Ringmills finish 'em off quickly in reducing the most refractory rocks. "AMERICANS" are known throughout the industry for ruggedness, power and sterling dependability . . . they deliver 10 to 100 tons per hour, with no "time-outs." Comparatively low first cost, easily installed and they operate economically. Product comes out uniform and cubical.

AMERICAN PULVERIZER CO.
1059 Macklind Ave. St. Louis, Mo.



★

YOUR COPY IS READY

Q-82

34 JOB PHOTOGRAPHS

The new Barber-Greene Bucket Loader Catalog 82 shows 34 photos of B-G Loaders saving time and money on different types of work including: truck loading from stock piles, road shoulder cleanup, top soil stripping, reclaiming, screening, loading scarified base, etc. Also specifications and accessories. Write for your copy.

BARBER GREENE
AURORA ILLINOIS

Finest Subway Entrance to all Points of Interest

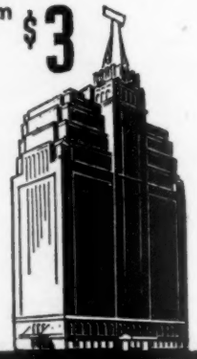
New York's Popular HOTEL LINCOLN

44TH TO 45TH STS. AT 8TH AVE.

OUR CHOICEST ROOMS From $3

1400 ROOMS each with Bath, Servidor, and Radio.
* Four fine restaurants awarded Grand Prix 1940 Culinary Art Exhibition.

MARIA KRAMER
PRESIDENT
John L. Horgan
Gen. Mgr.
HOTEL EDISON
SAME OWNERSHIP



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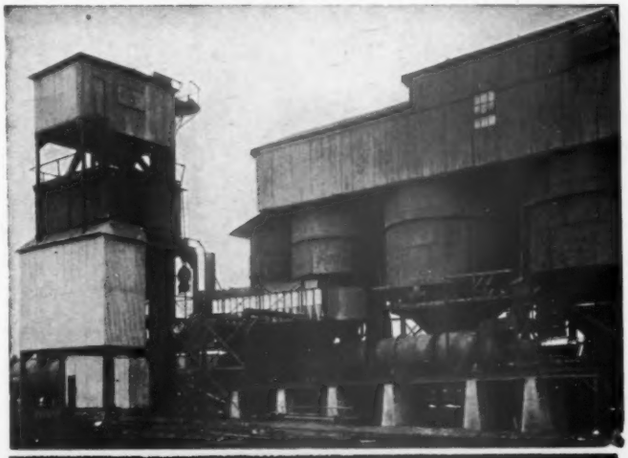

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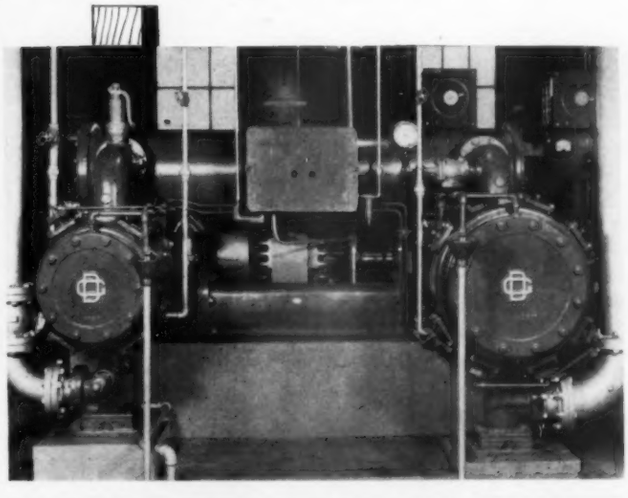

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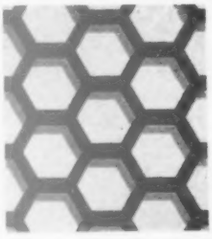

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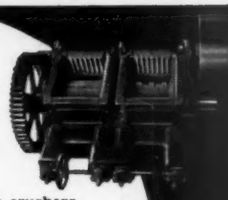

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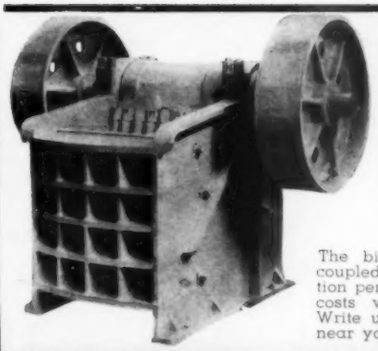

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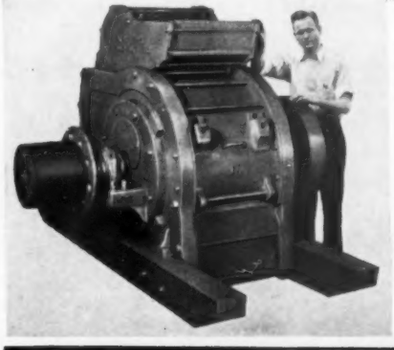

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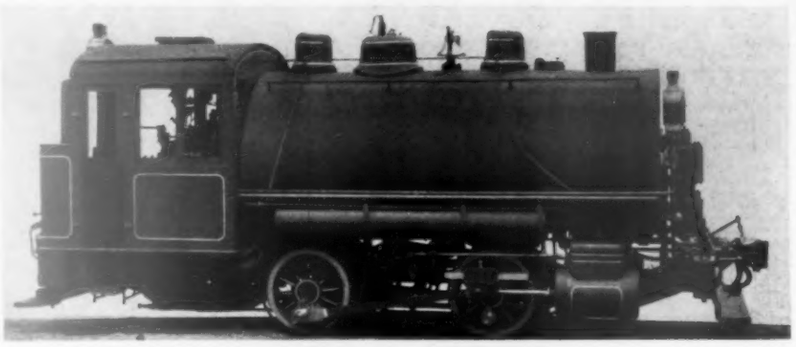

FOR SALE

1—30 ton 4-Wheel Saddle Tank Switching Locomotive in excellent condition with tractive power of 12,400 lbs. Available for immediate inspection and shipment with quotations gladly furnished.

RAILWAY ACCESSORIES COMPANY
3408 CAREW TOWER **CINCINNATI, OHIO**

SUBJECT TO PRIOR SALE
We Offer

1—Ohio, Type G, 35 Ton Steam Locomotive Crane, No. 3926 Bucket Operating.
1—American 30-Ton Locomotive Crane, 55′ Boom.
1—Brownhoist 15-Ton Locomotive Crane, No. 8332.
1—Lorain 77—1½ Yd. Diesel Shovel—Dragline, No. 5570, new 1937.
1—Link-Belt K-55, 2 Yd. Dragline, Gas.
1—Plymouth 18-Ton Standard Gauge, Gas Locomotive.

SPECIAL
23—C. P. No. 5 Drifters, Complete with Shells and Screws—$65.00 each.
Money Back Guarantee.

2—Plymouth 8 Ton, Standard Gauge Gas Locomotives.
1—Whitcomb 6 Ton, 24″ Gauge Gas Locomotive.
1—Terry 25 Ton Steel Stiff Leg Derrick 3 line, 90′ Boom.
1—Flory 10x12, 3-Drum Steam Hoist with Separate Swinger and Banked Levers.
1—Ingersoll-Rand XL, 420′ Actual Capacity Portable Compressor, Like New, Cheap.
1—Chicago-Pneumatic 664′ Diesel Compressor.
7—Hayward 1—1½—2 Yard Rehandling Buckets.

Many Other Units. What Do You Need?

CHARLES DREIFUS
Widener Bldg., Philadelphia, Pa.
Rittenhouse 7750

GASOLINE LOCOMOTIVES

1—12-ton Davenport, standard gauge, gasoline locomotive powered by 4-cylinder Le Roi Engine, complete with electric starter, full steel cab, straight and automatic air brakes. MCB couplers. Rebuilt. Excellent Condition.

1—8-ton Vulcan, standard gauge, gasoline driven locomotive; powered by heavy duty four-cylinder engine; used less than 100 hours, fitted with Lincoln pin couplers. Complete and in excellent condition.

ATLANTIC EQUIPMENT CORP.
50TH AND GRAYS AVE.
PHILADELPHIA, PA.
Tel. Evergreen 6363

ELECTRIC HOISTING ENGINES
DOUBLE DRUM

1—Lambert with 30 HP 3 Phase Motor.

1—Lidgerwood with Independent operating winch heads. With 100 HP 3 Phase Motor.

1—Lidgerwood with Dual Safety Foot Brakes. With 100 HP 3 Phase Motor.

PHILADELPHIA TRANSFORMER CO.
2829 Cedar Street **Philadelphia, Pa.**

Rebuilt Equipment

BROWNING Model 8-DT, 20 Ton 8-Wheel Locomotive Crane.
VULCAN 8 ton Std. Ga. gas locomotive.
BALDWIN 58 ton 6 wheel switcher, 19x24″ cyl. Walscheart valve gear.
DAVENPORT 22 ton 4-wheel Saddle Tank; Cyl. 11x16.
P&H Model 330, ¾ Yd. Dragline.
PLYMOUTH 12 Ton 36″ Ga. Gasoline Locomotive; Hand Brakes.
BROWNHOIST Model 4, 20 Ton 8-Wheel Locomotive Crane.
3 PLYMOUTH Model FL, 24″ Ga. Gasoline Locomotive.
1 WHITCOMB Model CS-4, 4½ Ton, 24″ Gauge Gasoline Locomotive.
KOEHRING Model No. 1, ¼ Yard Comb. Shovel, Crane & Dragline.
P&H Model 206, ¾ Yd. Comb. Crane & Dragline; 38′ Boom.
NOVO Model DHG, 40 h.p. Gasoline Double Drum Hoist; on 4 Steel Wheels.

Write for Complete List
SOUTHERN IRON & EQUIPMENT COMPANY
Plant & General Offices
Atlanta, Georgia

LOCOMOTIVES
SHOVELS—CRANES
ATTRACTIVE PRICES

1—80 Ton American 0-6-0 Switcher
1—75 Ton Baldwin 0-6-0 Switcher
2—40 Ton American Saddle Tanks
1—38 Ton Vulcan Saddle Tank
1—38 Ton Porter Saddle Tank
2—25 Ton Plymouth Gasoline
STANDARD GAUGE—RECONDITIONED

1—Marion 480 Combination Steam Shovel & Crane
1—52-B Bucyrus Dragline Atlas Imperial Diesel Engine—70 ft. Boom
1—25 Ton Browning 8-C Steam Locomotive Crane

Birmingham Rail & Locomotive Co.
BIRMINGHAM, ALA.

PRICED FOR QUICK SALE

1—48″ Symons Horizontal Disc Crusher (Nordberg Mfg. Co.), completely overhauled, rated capacity 1″ product, 45-60 T.P.H. $1,000.00
1—8″ Allis-Chalmers Style N Gyratory Crusher, No. T715, like new; used only one season. Manganese fitted, non-choking concaves, smooth head for fine crushing, extra head for coarse crushing $850.00
1—No. 1 Allis-Chalmers Gyratory Crusher, manganese fitted $250.00
1—Allis-Chalmers Eccentric with manganese steel gear for No. 5 style K crusher, like new. $150.00
1—30″x16″ Wis. Foundry Crushing Rolls... $450.00
1—24″x14″ Wis. Foundry Crushing Rolls... $275.00
Several Vibrating Screens, Bucket Elevators, Sand Classifiers, Electric and Gasoline Motors, 2″, 3″, 4″, 6″ Self-priming centrifugal pumps with gasoline motors; 1½″, 2″, 3″, 4″, 6″ centrifugal pumps with electric motors.
1—Portable Air Compressor, on pneumatic tired wheels, 160 c.f.m. actual air.
1—Portable Air Compressor, on pneumatic tired wheels, 105 c.f.m. actual air.
Above compressors are like new, have been used only a few months.
1—Link-Belt Shovel Boom Assembly with 1 yard Amsco dipper, excellent condition, will fit models K1, K2, K35, K42.
1—Northwest ¾ yard Shovel Boom Assembly for Model 104-105.
1—P&H ¾ yard Shovel Boom Assembly for Model 206.

LIPPMANN ENGINEERING WORKS
4603 W. Mitchell Street **Milwaukee, Wis.**

SHOVELS—CRANES

1—Lorain-79 Diesel Shovel and Crane, new late 1939, 1½ yd. new 50′ crane boom, slightly used, like new.
1—Osgood 1-yd. Gas Shovel cheap.
1—10-ton cap. Browning Electric Crane 40′ Bm.
1—Universal Truck-Crane solid tires.
1—Northwest Backhoe attachment, first class

GREY STEEL PRODUCTS CO., INC.
74 Central Ave., **Glen Rock, N. J.**
Tel. Ridgewood 6-2275

DRAGLINES—TRACTORS, ETC.

1—Northwest No. 7 with 50 ft., boom, cap. 1¾ yd. Like New.
1—Northwest 1¼ to 1½ yd., 50 ft., boom, good shape.
1—Bucyrus 1½ yd. Atlas Diesel. Fine shape.
5—Allis-Ch., and Caterpillar tractors. Models "LO," "L" and "50."
Also other equipment of all kinds.

RENNOLDS EQUIPMENT CO.
13913 So. Halsted St. **Chicago, Ill.**

FOR SALE

½ yd. Unit shovel, gas, caterpillar, full revolving $1000.00
1 yd. Koehring, gas, caterpillar full revolving 2500.00
Complete 18x36 roller Bearing Universal Jaw Crushing plant, Double Rolls, Vibrating screens, etc.
Complete ½ yd. Sauerman Drag Scraper, Case tractor, Samson double drum hoist, etc. 600.00

GEORGE KENNEY
2136 Jefferson St. **Kansas City, Mo.**

DEPENDABLE USED MACHINES

15x36 roller bearing jaw crusher.
110 ft. compressor on Chev. truck.
Universal truck crane on Mack truck.
Northwest 105 dragline.
3/4 yd. Kiesler bucket, rebuilt.
Allis-Chalmers 35 with buildozer.

TRACTOR & EQUIPMENT CO.
433 S. Jefferson St., Chicago
Branch: P. O. Box 832, Springfield, Ill.

FOR SALE

Marion 450 gas electric drag line machine equipped with drag line and clam shell buckets, 50 foot boom. Excellent condition. Late shop number. Priced to move.

Send replies to
BOX 208
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. **Chicago, Ill.**

Your IMPERATIVE NEEDS
Can Be Met with the Consolidated BIG FOUR

SOME SPECIAL ITEMS

1—30″ Allis-Chalmers Superior McCully Gyratory Crusher, also 20″ Traylor "Bulldog," 36″ Gates "N," 30″ Kennedy with motor.
2—10″ and 6″ Allis-Chalmers Superior McCully Reduction Crushers, with bell heads and new concaves.
1—8′x125′ Reeves Bros. Rotary Kiln.
2—8′x80′ and 6′x80′ Kilns, both Vulcan Iron Works. Excellent construction and in splendid condition.
1—5′x10′ Allis-Chalmers 2-deck Vibrating Screen, also 2—4′x8′ Stephens-Adamson, double deck.
3—8′x72″ Hardinge Conical Ball or Pebble Mills, also 8′x30″ iron lined, with 175 H.P. motor.
3—700 CFM Worthington Type V-6 Air Compressors, 100-lb. each twin unit with 200 H.P. 3/60/440 volt motor, direct connected both ends.
1—Lime Hydrator, Weber type, Arnold & Wiegle—with No. 1 Raymond Bros. Lime Separator.
1—5-roll Raymond low side Separator, with oil journals. Also one Raymond Single Whizzer for attaching to 4 or 5-roll mill.

(1) Large Selection of Machinery in our Newark, N. J., Shops and from many other points in the U. S.

(2) Country-wide Coverage

(3) Experienced Staff

(4) Substantial Savings —Always

We have sold most of the equipment from the Castalia Portland Cement Plant in Castalia, Ohio, 60 miles from Cleveland. The following is still available for immediate shipment, at low prices:

1—5′x10′ Bonnot Ball Mill, steel lining, peripheral discharge.
3—Rotary Kilns; 6′x120′, 6′x60′.
1—6′x60′ Direct Heat Rotary Dryer.
1—5′x22′ Bonnot Tube Mill, silex lined.
2—5′x27′ Tube Mills, silex lined, with 200 H.P. motors.
2—18 ton Steam Locomotives, Vulcan and Porter, 36″ ga.

Send for latest crushing "News" listing other sizes of Jaw, Gyratory and Roll Crushers; Gyratory Finishing Crushers, Shovels, Cranes and Draglines; Locomotives; Vibrating Screens; Elevators; Conveyors; Pulverizers; Ball, Tube and Rod Mills; Filters; Air Classifiers; Dorr Classifiers; Air Compressors, etc.

CONSOLIDATED PRODUCTS CO., INC.
17-19 PARK ROW NEW YORK, N. Y.
Our Shops at Newark, N. J., cover eight acres.

MARION 450—1¼ YD. SHOVEL-DRAGLINE COMBINATION

This Machine is in very Good Operating Condition. Ready for Immediate Shipment. Subject to Inspection.

22 Ft. Standard Shovel Boom. 15 Foot Standard Dipper Stick. 1¼ yard Manganese Dipper Secondary Drum and Spider and Dragline Attachment. Six Cylinder Buda Gasoline Engine with Three Electric Motors for Hoist-Swing-Travel. 40 Foot Two Piece Dragline Boom and Fairlead. Standard Crawler.

Price $5,500.00 F.O.B. Detroit, Michigan. Shipment Now.

W. H. ANDERSON EQUIPMENT CO., INC.
47 Seven Mile Road, Detroit, Mich.

FOR SALE

2½ Yd. Electric Slackline Cableway.
1 Yd. Electric Slackline Cableway.
1¼ Yd. Osgood Crane Gas Crawler.
1¼ Yd. P&H Shovel and Backhoe.
1 Yd. Link-Belt Crane.
1 Yd. Osgood Crane and Shovel.
½ Yd. General Crane and Shovel.
1 Yd. P&H Crane and Backhoe.
8 Ton Gas Std. Gauge Locomotive.
12 Ton Gas Std. Gauge Locomotive.
5 Ton Gas 36″ Gauge Locomotive.
5 Ton Austin Gas Tandem Roller.
10 Ton Bflo-Spgfld. 3W Steam Roller.
No. 4 Gas Keystone Half Crawler 24″ and 48″ Ditchers & Skimmer Scoop Bucket.
6″ Vertical Electric Submerged Pump.
4″ Jaeger Sure Prime Gas Pump.
2½ ton 8″ E. C. & B. Pipe Threading Machine.
150 Ton R.R. Track Scales.
Storage Tanks, Boilers, Motors, Power Units. All Kinds of Equipment.

THE T. J. LANE CO.
Springfield, Ohio

Bucket Elevators: Enclosed-Continuous-Spaced 24″x60″ 20″x40′, 16″x60′, 14″x50′, 14″x32′, 12″x35′, 10″x35″ 8″x32′, 5″x32′, 5″x14′.

Jaw Crushers: 10″x4″, 15″x9″, 16″x9″, 18″x12″, 20″x12″, 36″x24″, 36″x28″.

Gyratory Crushers: No. 36 Kennedy, 8″ Traylor, and 6-A Telsmith.

Screens: Vibrating and Revolving:
12 Tyler Hummer Vibrating, with V-16 Heads.
120 New Hummer Ton-Cap 3x5 and 4x5 Wire Cloth.
3x5 1-deck Multirap Vibrating, with Washer.
3x8 1-deck Link-Belt Vibr., with Feed Gate.
4x8 2-deck Robins Perfex Shaking type.
3½x20, 4x21 and 5x18. Revolving, on Trunnions

Conveyors: Belt and Gravity:
16″x20′ Jeffrey and 18″x44′ B-G. Portables.
Trough and Return Idlers for 12″ to 30″ Belt.
150 Head and Tail Pulley Conveyor Assemblies.
850′ Nearly New 36″-w. 6-p. rub. cov. Belt.
300′ Nearly New 30″-w. 5-p. rub. cov. Belt.
100′ of 30″-w. Gravity Rolls, 10′ Sections.
Feeders—24″x7′ Plate and 36″ Apron type.
3—Magnetic Belt Pulleys.

Other Equipment:
10 Centrifugal Water Pumps, Gas and Electric.
Clamshell Buckets—¾, 1, 1½-yard cap.
Dragline Buckets—½, 1, 1½-yard cap.
Gasoline Engines—3, 7, 12, 25 and 50-hp.
1-yd. Ransome Mixer, with Waukesha Engine.
Loomis Clipper Blast Hole Drill, gasoline.
4′ x 30′ Ruggles-Cole Rotary Kiln.
Bin Gates—18x18, 16x16, 12x12 Lever type.
Storage and Pressure Tanks. Also Truck Scales.

Industrial Railway Equipment:
36″-g. Whitcomb 8-ton Gasoline Locomotive.
36″-g. Plymouth 7-ton Gasoline Locomotive.
36″-g. Vulcan 4-ton Gasoline Locomotive.
2—30″ Mercury 2-ton Battery Locomotives.
8—36″ Koppel Cars, 3-yard V-shaped.
12—24″ Koppel Cars, 1-yard V-shaped.
5—24″ Easton Cars, 1¼-yard V-shaped.
12—24″ Atlas Cars, ½-yard End Dump.
1000′ of 24″ Track, Curves and Switches.

G. A. UNVERZAGT, 15 Park Row, New York City

PEDIGREED STOCK

2—Bucyrus-Armstrong Model 26T 6″ well drills, new condition, with 4 cyl. Le Roi engines, 32′ steel derricks.
Will handle 1600 lbs. of tools and 4″ to 8″ bits.

L. B. SMITH, Inc. *Immediate shipment* **Suburb of Harrisburg**
Camp Hill, Pa. **Harrisburg 7331**

POSITION WANTED

Operator, married, 20 years' experience on steam, diesel and electric draglines or shovels. Prefers steady work in rock quarry, gravel pit or strip mine. Experience on repair, tools. Sober, reliable. Best references.

Send replies to
BOX 204
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

WANTED SALES REPRESENTATIVE

To sell well-known line of cast steel specialties, Crane Wheels, Conveyor Chain, Sprockets, Elevator Buckets, and similar parts. In reply advise lines you are now handling, district covered and previous business experience. Address

BOX 202
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Illinois

POSITION WANTED

Plant manager with long experience in quarry and lime burning, with thorough knowledge of every phase of plant operation.
Address replies to

BOX 108
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE OR LEASE

157 acres in Rose Township, Oakland Co., Michigan. This excellent property contains good gravel of undetermined proportions, located on a stream and lake for water supply. Farm is 40 miles from Detroit, which is an excellent market for sand and gravel and on a main line railroad. Will sell or lease on royalty basis. Send replies to Box 104

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538 S. Clark St. Chicago, Ill.

FOR SALE

READY MIX CONCRETE PLANT, 1 YARD CAPACITY—EXCELLENT CONDITION.

SUBURBAN CONSTRUCTION CO.
Ardmore Penna.

Whirley Crane—Gas Power, Cap. 7 tons @ 70'.
Bridge Crane, AC, 2 yd., bucket travel 125'.
Loco. Crane, 20 ton, real bargain. Others 10-35 ton.
Link-Belt 1-1¼-1½-1¾ & 2 yd. cranes—drags—shovels.
Koehring 702 crane-drag. Bay City ⅜ yd. dragline.
Crane, ⅝ yd., full rev., needs repairs, low price.
Barber-Greene, Bates, & Link-Belt bucket loaders.
Vibrating Screens—1-2-3 deck, 2½'x6' to 4'x10'.
Buckets—Clamshell-dragline—Scraper, etc., ¼ to 6 yd.
Kiln-Dryer 8'x80', 42" inner tube. Real bargain.

JAMES WOOD, 53 West Jackson Blvd., Chicago, Ill.

FOR SALE—CHEAP

One 100 hp. Allis-Chalmers squirrel cage motor, 440 volt, 60 cycle 720 RPM.
One 100 hp. Allis-Chalmers squirrel cage motor, 2300 volts, 60 cycle 720 RPM. Both motors practically new. Frankie flexible coupler with 440 v. machine.
One Giant stump puller with inch cable and hook for moving cars.
One 5/8 yard Byers Bear-Cat dragline, completely overhauled.
All this material is first-class and can be had very cheap.

RIVERSIDE GRAVEL CO. Omaha, Nebraska

2—120 Ton, 2 Comp. Bins, Batchers, Scales. 10 Ton Loco Crane, 1 Yd. Kiesler Clamshell.
Telsmith, Allis C. Kennedy, Traylor Gyratory Crushers. 36x28" Traylor Bulldog, 36x24" Farrell Jaw Crushers.
Sand, Gravel, Water Pumps, all Kinds.
Conveyors, Elevators, Screens, all types.
Clamshell, Dragline, Orange Peel Buckets.
Barber-Greenes Loaders, Shovels, Cranes.
Two 240 HP Fairbanks Diesels, 170 KW DC Generators.
Diesel, Nat. Gas, Steam Engines, with & without Gens.

Ask for Bulletin 51
MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa 2290 St. Louis, Mo.

Koehring 27E, 1 yd. paving mixer, good; ($1875).
Smith 56-S 2 yd. tilting mixers (2), elec., West.
Bucyrus-Erie 55-B Diesel dragline, 80' boom.
American 55 ton steam Mogul locomotive, A-1.
Plymouth 18 ton std. ga. gas locomotive, M.C.B.
Allis-Chalmers 750 K.W. water wheel-generator, A.C. 3-60-6600 v., 60' head, switchboard; West.
Euclid 6 & 8 yd. bottom dump cat wagons (18).
Caterpillar Model 60 gas tractors (8).
F-Morse 360 H.P. marine reversible Diesel engine.

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1—Air receiver tank 30"x7 ft.
2—Tanner tanks 11½" line prevents air line freezing.
2—Dry stopers Sullivan type DT44 with 600W rack.
2—18 cu. ft. quarry cars; Sasgen derricks.
9—12 cu. ft. tip over buckets.
2—1½ yd. stone skips and 2—2 yd. end gate boxes.
1—240 ft. two stage portable compressor and air tools.
Two drum gas hoists; Parsons 31 and 40 trencher.
Steam crane 54" boiler 50 ft. boom crawler type.
30 ft. boom for Link-Belt K2. Write complete list.

ANDERSON & CO.
56 E. 89th Place, Chicago, Ill.

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Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
FORT WAYNE, IND.

FOR SALE

Quarry ½ Mile South of Hollidaysburg, Pa. 100 acres of land, large deposit of high grade limestone. 1—Bell crusher, 1—jaw crusher, 1—set of rolls, 1—hammer mill, 1—ball mill, 1—air compressor, 3—drills. Plant equipped with electricity. Bin capacity 400 tons. 2—lime kilns, 1—Howe scale, 1—mule, 11—quarry cars, 1—Dumpster and 8 buckets, blacksmith shop, barn, garage, and a six room cement house. City water in house and at quarry.

CHIMNEY ROCK LIME AND STONE CO.
142 Bedford St. Hollidaysburg, Pa.

RELAYING RAILS

All sections new and relaying rail, spikes, bolts, frogs, switches, "V" Shaped, flat and Contractors' Cars, etc. Prices cheerfully quoted.

M. K. FRANK
480 Lexington Ave., NEW YORK CITY
25 St. Nicholas Bldg., PITTSBURGH, PENNA.

RAILS "1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
Buy from One Source—Save Time and Money. 'Phone, Write or Wire.

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

FIRST CLASS USED EQUIPMENT

1—30 ton capacity AMERICAN 8-wheel, 4'8½" gauge steam operated Locomotive Crane, 50' boom, steam brakes, lights, outriggers and new Boiler.
1—10x12, 3-drum NATIONAL Skeleton Hoist with 61'x10 separate swinger; banked levers.
1—SAUERMAN 50-HP 2-speed drag scraper hoist.

F. E. BAUER, JR., CO.
30 Church St. New York, N. Y.

PRICED FOR QUICK SALE

3—260 HP Buckeye DIESEL Engines dir. con. 175 kw. G.E. 2200/440/220/3/60 200 rpm. AC Generators complete.
1—10 ton Milwaukee Gasoline Locomotive.
1—6 ton Atlas Locomotive 220/3/60 36" ga.
1—80 kva Fair. Morse 2300/4000/3/60 dir. con. Van Blerck Gas or Gasoline Engines.
AC and DC Motors 1 to 1000 HP.

DUQUESNE ELECTRIC & MFG. CO.
PITTSBURGH, PA.

DIESEL ENGINES FOR QUICK SALE

1—Fairbanks-Morse, 60 H.P., 6-cyl., with Generator.
1—Caterpillar, 44 H.P., 4-cyl., with Generator.
1—Waukesha-Hesselman, 73 H.P., 6-cyl., with Generator.
1—Stover, 10 H.P., 1-cyl.
1—Witte, 5 H.P., 1-cyl., with Generator.
1—Fairbanks-Morse, 7½ H.P., 1-cyl., with Generator.

BOX 206
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Illinois

FOR SALE

No. 10 — Style K Allis-Chalmers Gyratory Crusher. First class operating condition. Located Catskill, N. Y. Plant North American Cement Corporation. Send inquiries to

NORTH AMERICAN CEMENT CORP.
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Royal E. Burnham

Attorney at Law

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L. H. HOFFMAN, Pres.

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HOFFMAN BROS. DRILLING COMPANY
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By using Diamond Core Drills We drill for Limestone, Gypsum, Talc, Fire Clay, Coal, and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
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FOR SALE

2—Allis-Chalmers Gyratory Crushers
No. 8—No. 6

M. S. ROSEN
G. P. O. Box 297 New York
Tel. Stillwell 4-3024

FOR SALE

2—12 inch Traylor Gyratory Crushers.
P&H 206 Crane.
9 and 4 ton 36" Ga. Storage Battery Locomotives.
36" Ga. 4½ yd. side Dump Cars.
Plymouth 3½ ton gasoline loco. 24" Ga.
Worthington 350' 100 lbs. Compressor.
Hoist and other Rock Drilling Equipment.

WENZEL & HENOCH CO.
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or
1524 North 27th St. Milwaukee, Wis.

FOR SALE

30-TON S/G LIMA GASOLINE, 0-4-0 SWG. LOCO. NEW 1931, GOOD COND. ROLLER BEARING. Immed. Delivery.
SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES.

IRON & STEEL PRODUCTS, INC.
13490 S. Brainard Ave.
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"Anything containing IRON or STEEL"

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SYMONS CONE CRUSHERS
In 2', 3', 4' and 5½' Sizes

NATIONAL EQUIPMENT CO.
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You Get 12 Big Issues of Pit and Quarry with

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BUCKETS
50 Skips and Battleship Type, 2 to 6 Yds.
3 Owen & Bucyrus Rock Grabs.
CLAMSHELL: ¼, ¾, 1, 1½ & 2 Yds.
ORANGE PEEL: ¾, 1, 1½, 2 & 3 Yds.
DRAGLINE: ¼, ⅜, 1, 1½ & 3 Yds. Cap.

CRANES & DRAGLINES
8 Ton BROWNHOIST, 80 ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas.
12 Ton KOEHRING 45 Ft. Boom Gas.
16 Ton Speederane, Gas, 50 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Locomotive.
25 Ton LINK BELT K-43 Electric, 70 Ft. Boom.
2½ Yd. Lorain Drain Model 95, Diesel Dragline.

CATERPILLAR SHOVELS
½ Yd. P. & H. Gas & ¾ Yd. Insley Gas.
¾ Yd. KOEHRING Gasoline.
¾ Yd., 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas & 7/8B2 Steamer.
1½ Yd. BUCYRUS 41B Steamer.
1¼ Yd. Lima 750 Diesel
1½ Yd. KOEHRING 601—Gas.

OIL DISTRIBUTORS' TRUCKS
3—1000 gal. ETNYRE Mack.

DUMP CARS
46—KOPPEL, 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd. 4 Yd. 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill.
5x5 Batch Mill.
5'x22" HARDINGE CONICAL Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
4x8, 8x6, & 10x9 Straight Ball Mills.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x16, 5x15, 5x22, & 6x22 Tube Mills.
3½x8 & 5x7 Air Swept Tube Mills.
2x4¼, 3x13 and 6x14 ROD MILLS.
4x16 Smidth Tube Mill Silex.
5½x20 Smidth Tube Mill Mang. Lining.
3¼x18 F & M Tube Mill Silex.

PULVERIZERS
No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER 2XB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators

ROLL CRUSHERS
36x60 Fairmont Single Roll.
36x20 Diamond Double Roll.
24x24 & 36x16 & 36x20 Diamond Double Roll.

JAW CRUSHERS
10x8, 13x7¼, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 54x66, 36x16, 9x36.
30x10 Gruendler Roller Bearing.

CONE & GYRATORY CRUSHERS
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
21K & 18N Allis Chalmers.
4-10 T2 Traylor 4 Ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T. Gyratory, Telsmith No. 9.
17 Gates K—Nos. 3, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullus.
KENNEDY: Nos. 19, 25, 27, 39 & 49.
16" Traylor.
7 Ft., 5 Ft. and 3 Ft. Symons Cone.

DRILLS
4—SANDERSONS 14 & LOOMIS 44.
7—Ingersoll-Rand Wagon Drills, FB & M2
20T ARMSTRONG Well Drill.

HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12.
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

HAMMER MILLS
4 Jeffreys: 24x15-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Gruendler No. 6X.

STEEL BINS
72 Ton BLAW-KNOX 2 Compt.; also 250 ton.
100 Ton BLAW-KNOX 2 Compt.

CEMENT BIN
400 Bbl. Portable BUTLER Bulk Cement Bin with Puller Full Automatic Electric Push Button Weigh Batcher.

SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-350-275 volt
150 K.W. GEN. ELEC. 3/60/2200-250-275 volt
200 K.W. RIDGWAY 3/60/2200-250-275 v., 900 rpm.

DIESEL GENERATORS
240 K.W. F.M. 3/60/2300 v.
300 K.W. Worthington 3/60/2400 v.
125 K.W. F.M. 250 v. D.C.

RAYMOND MILL
5 Roll High Side.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1443 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
IDLERS: 36 In., 30 In., 24 In., 20 In., 18 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 ft. 24 In., 30 In. & 36 In. Sections.

ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES
DIESEL: 7—4½, 8 and 15 Ton 36 & 42 In. Ga.
GASOLINE: 8 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

SCREENS
VIBRATING: 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72, HUMMER, ROTEX, NIAGARA & ROBINS, LINK BELT & HURON.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x28, 4x24, 5x30, 8x20, 6x20.

SAND WASHERS AND CLASSIFIERS
4 LINK-BELT A-60 In. Classifiers.
7 ALLEN Cones 4 Ft., 5 Ft., 6 Ft., 8 Ft.
30" Reciprocating Plate Feeder.

RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

SAUERMAN DRAG AND SLACKLINES
1— ¾ yd. Gas 1—1¼ yd. Electric
1—1 yd. Electric 2—2 yd. 3 yd. & 4 yd. Electric

42 IN. BELT CONVEYOR
350 Ft. Barber-Greene Sectional Steel Frame Roller Bearing Belt Conveyor. New 1939.

JACK HAMMERS AND DRIFTERS
21 Worthington 169 Drifters.
12 Worthington 180 Drifters.
48 Gardner-Denver 15 Jackhammers.
45 Ingersoll-Rand Drifters S70, N75, X71, DA35.
11 Ingersoll-Rand S49 Jackhammers.

R. R. TRACK SCALE
125 Ton 56' x 10'6" Platform 4 Section.

WHIRLEY CRANES
5 Clyde 75 to 100 ft. Boom.

DIESEL UNITS
96 H.P. Waukesha Hesselman.
2—370 H.P. Chgo. Pneu. RHA45S, 360 rpm.
420 H.P. Sulzer, 1000 rpm.
600 H.P. B. & W., 550 rpm.

CONE CRUSHERS
Symons No. 5½ and 7 Ft.

(Cable Address: "STANEQUIP" New York)
Lincoln Bldg., 60 E. 42nd St., New York, N. Y.
Murray Hill 2-3075 or 2-3076

R. C. STANHOPE, INC.

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ON

RUBBER BELTING

Transmission—Conveyor—Elevator

"V" BELTS

FOR

Pumps—Crushers—Pulverizers—Etc

RUBBER HOSE

FOR

AIR—WATER—STEAM—ETC.

Partial Stock List

NEW AND HEAVY DUTY

Conveyor and Elevator Belting

Quantity	Width	Ply	Type Cover	Bottom Cover	Type
505 Ft.	36"	6	1/8"	1/16"	Conveyor
856 Ft.	30"	6	1/8"	1/16"	Conveyor
458 Ft.	30"	5	1/8"	1/16"	Conveyor
1905 Ft.	24"	5	1/8"	1/32"	Conveyor
250 Ft.	24"	6	1/16"	1/16"	Elevator
1298 Ft.	24"	4	1/8"	1/32"	Conveyor
250 Ft.	22"	8	1/16"	1/16"	Elevator
210 Ft.	22"	8	Friction		Elevator
874 Ft.	20"	5	1/8"	1/32"	Conveyor
1765 Ft.	18"	4	1/8"	1/32"	Conveyor
750 Ft.	16"	4	1/8"	1/32"	Conveyor
1509 Ft.	14"	4	1/16"	1/32"	Conveyor
310 Ft.	12"	6	Friction		Elevator
356 Ft.	12"	4	1/16"	1/32"	Conveyor
226 Ft.	10"	6	1/16"	1/32"	Elevator

We will cut any of above rolls. Advise desired lengths and widths and we will promptly quote prices. Many other sizes in stock for immediate shipment.

CARLYLE RUBBER CO., Inc.
62 Park Place New York, N.Y.

FOR PROMPT SHIPMENT SUBJECT TO PRIOR SALE

Good Used Crushers and Pulverizers

15x24 Blake Type Jaw Crusher
Model K Day Lime Pulverizer (3 ton hr.)
No. 7 Mitts & Merrill Wood Hog
Gruendler (20 tons per hour) cast steel frame construction. Pulverizer good as new
Reconditioned CRUSHING PLANT includes, 15&36 Jaw and 30x18 Roll Crusher, Elevator, Screen, Bin, Power Units (will sell in separate units)
3—Portable LIMESTONE PULVERIZERS—6 to 7 ton per hour,—will handle 60 lb. Rock to Agricultural dust or 15 to 18 tons per hour road rock each

CRUSHER SERVICE
Box 795, St. Louis, Mo.

FOR SALE

1—¾ cu. yd. Sauerman Cable way dipping outfit complete (gasoline power)—Price $1100.00.
2—6 inch gravel pumps—Price $150. and $300.00.
1—Orton crane and dragline, 47 ft. boom, very good condition—Price $1850.00.
2—Bear Cat Cranes, combination hoe, skimmer and crane—Price $800.00 each.
2—Semi-trailers, flat bottom, one (1) 20 ft. $200.00; one (1) 27 ft. $350.00.
1—Cletrac 40 with power take-off—Price $300.00.
1—Portable gravel crushing plant, complete and in very good condition, $3000.00.
3—65 H.P. Waukesha power units—Price $300.00 each.
1—40 H.P. Waukesha power units—Price $200.00.
1—one (1) cu. yd. dragscraper outfit with 40 H.P. Waukesha Motor—Price $400.00.
1—Thomas ¾ yd. electric hoist—Price $800.00.
2—36 inch rotary screens with scrubber sections—Price $300.00 each.
1—No. 3 Gates Gyratory crusher—Price $450.00.
1—14 x 24 Roll crusher—Price $250.00.

IRVING BROTHERS GRAVEL CO.
New Haven, Indiana

FOR SALE

Gas Producer

R. D. Wood & Co. Type SB-10.
Used about 3 years. Condition good.

AMERICAN LIME & STONE CO.
Bellefonte, Pa.

FOR SALE

1—450 HP Cross Compound Steam Engine.
1—18"x42" Simple Corliss Engine.
150 HP Boilers HRT Complete.
125 HP Scotch Marine Boiler.
60 HP Scotch Marine Boiler.
180 HP F.M. 3 Cyl. Belted Diesel Engine.
23,000 Gal. 10'6"x30' Storage Tank.
10,000 Gal. 7' x30' Storage Tank.
10,000 Gal. 5' x40' Storage Tank.
Other Tanks, Boilers, Cranes, Shovels.
All Kinds of Equipment.

THE T. J. LANE CO.
Springfield, Ohio

FOR SALE

CRANES: Ohio model "E" 25 ton capacity steam locomotive crane, eight wheel double drums, 50' boom.

Industrial type "H" 25 ton capacity, steam locomotive crane eight wheel, double drums, 50' boom.

Smith 56-S Tilting Type Concrete Mixer, 2 cubic yard capacity, excellent condition.

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1119 S. 56th St. Philadelphia, Pa.

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KILNS: 8'x80', 8'x125', 9'x160'.
DRYERS: 6'3"x24', 4'x40', 5'6"x40'.
BALL MILLS: 5'x8', 6'x8', 5'x22'.
HARDINGE MILLS: 4½'x16", 6'x22", 5'x22", 8'x30".
RAYMOND MILLS: No. 0000, 00, 1, 3, 3 and 5 rolls.
HAMMER MILLS: Williams, Gruendler, etc.
We Purchase Single Items to Complete Plants.

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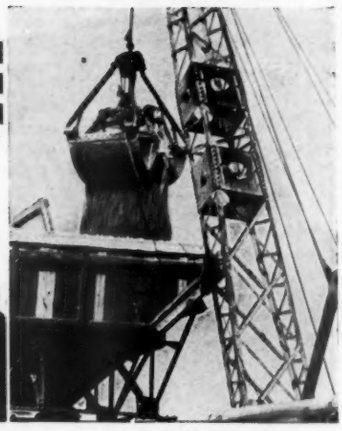
OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAYS WORK

Manufactured by OWEN are designed by experienced engineers to get capacity grabs in crushed stone, gravel, sand, coal and similar materials. Proper weight distribution and special shell curvatures assure rapid dumping action with minimum of resistance to material.

THE OWEN BUCKET CO.
6050 BREAKWATER AVE., CLEVELAND, O.

BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.



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Weigh less than ½ ounce

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PLACE HEADBAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
PRESS EDGES OF FACE PLATE DOWN TO FIT FACE SNUGLY

Made of Soft Rolled Aluminum. So light and comfortable that workers will wear them without objection.

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THIS SMART OPERATOR SELLS 100% OF HIS PRODUCT

— *because his plant can now supply smaller sizes of crushed stone demanded by changing specifications*

TELSMITH
Intercone Crusher

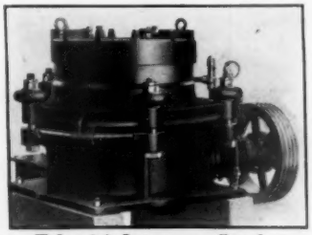
The Crystal Lake Crushed Stone Co., Sheboygan, Wis., found that 20% to 30% of their product went to the stockpile instead of to market. The reason? Changes in specifications had created a market demand for smaller-sized stone. There was little demand for these coarser sizes.

Early in July, 1940, a Telsmith Intercone Crusher was installed. They're selling 100% of their product now. The Intercone is crushing down to the sizes the market uses. It has increased by 50% the plant's capacity for plus 1/8" to minus 3/8" stone chips. The product is finer and better, too. The output of torpedo sand is increased, and its quality improved on account of its larger content of stone particles.

The Intercone has operated on an average of 8 hours daily, crushing minus 1½" to plus ½" Wisconsin moraine gravel. Discharge is set at plus 3/8"; capacity feed, 10 yds. per hr. A 20-hp. motor powers the Intercone. There has been no oil loss; no maintenance. Operating costs here, as everywhere, have been surprisingly low.

In your plant a Telsmith Intercone will *make* money and *save* money for you. And you can buy it at a price—*the lowest for any reduction crusher of equal size.* Get the details in Bulletin IC-15.

In this plant *other Telsmith equipment includes:* Rotary Feeder, 8-A Primary Breaker, 40" x 14' Hercules Gravel Washer, 34' No. 5 Belt Elevator, 28" x 12' Screw Rewasher, 2' x 6' Single Deck Pulsator, 16" x 22' Conveyor.



Telsmith Intercone Crusher

SMITH ENGINEERING WORKS, 504 EAST CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

IC-4

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